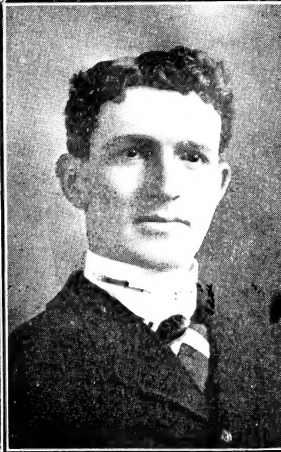
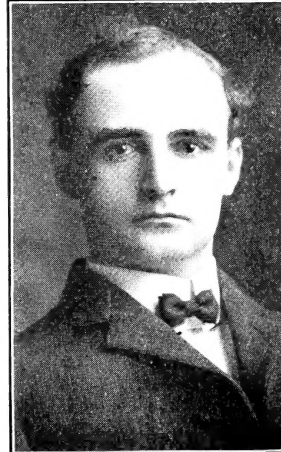
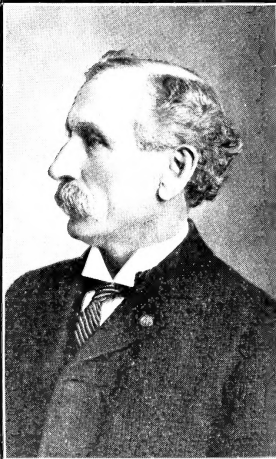
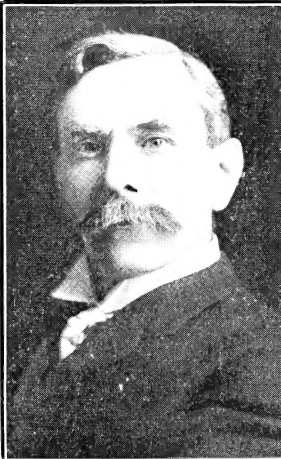
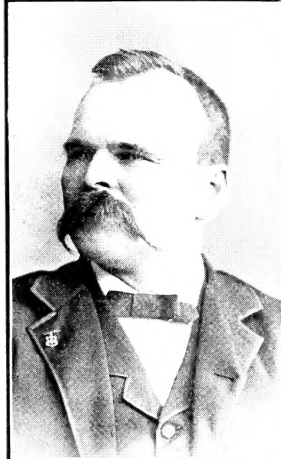
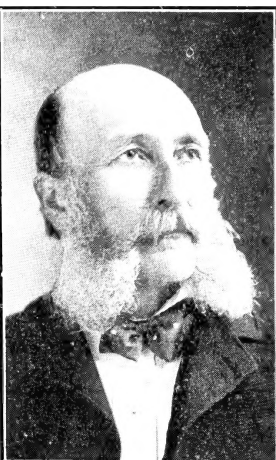
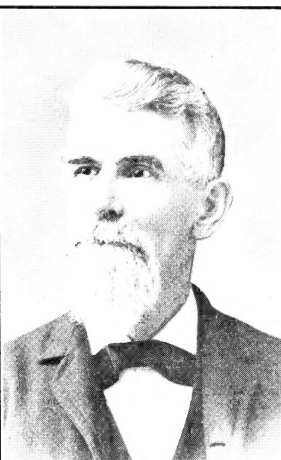


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Directors and Other Officers, Illinois Dairymen's Association.



GEO. CAVEN, Secy.
L. A. SPIES, Vice Pres.
IRVIN NOWLAN

J. R. BIDDULPH
JOSEPH NEWMAN, Pres.
JOHN COOLIDGE, Treas.

M. LONG
G. H. GURLER
L. N. WIGGINS.

Thirtieth
Annual Report

OF THE

Illinois

Dairymen's Association



CONVENTION HELD AT
Greenville, Illinois, January
5th, 6th and 7th, 1904



Compiled by GEO. CAVEN, SECRETARY
Stenographic Report by E. EMMA HIGINBOTHAM

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LETTER OF TRANSMITTAL

Office of Secretary,
Illinois Dairymen's Association.
Chicago, Ill., 1904.

To His Excellency Richard Yates, Governor of the State of
Illinois:

I have the honor to submit the official report of the Illinois
Dairymen's Association, containing the addresses, papers, and
discussions at its thirtieth annual meeting, held at Greenville,
Illinois, January 5, 6, and 7, 1904.

Respectfully,
GEO. CAVEN, Secretary.

582762

LIST OF OFFICERS, 1904

President—

JOSEPH NEWMAN, Elgin.

Vice President—

L. A. SPIES, St. Jacob.

Directors—

GEO. H. GURLER, DeKalb.

JOSEPH NEWMAN, Elgin.

L. A. SPIES, St. Jacob.

M. LONG, Woodstock.

IRVIN NOWLAN, Toulon.

L. N. WIGGINS, Springfield.

J. R. BIDDULPH, Providence.

JOHN COOLIDGE, Galesburg.

Secretary—

GEO. CAVEN, Chicago.

BY - LAWS

OF THE

Illinois Dairymen's Association

Officers.

Section 1.—The officers of this Association shall consist of a President, Vice President, Secretary, Treasurer, and Board of Directors, composed of seven members, of whom the President and Vice President of the Association shall be members and the President ex-officio Chairman.

Duties of the President.

Sec. 2.—The President shall preside at the meetings of the Association and of the Board of Directors. It shall be his duty, together with the Secretary of the Board of Directors, to arrange a program and order of business for each regular annual meeting of the Association and of the Board of Directors, and upon the written request of five members of the Association it shall be his duty to call special meetings. It shall be his further duty to call on the State Auditor of Public Accounts for his warrant on the State Treasurer, for the annual sum appropriated by the Legislature for the use of this Association, present the warrant to the Treasurer for payment and on receiving the money receipt for the same, which he shall pay over to the Treasurer of the Association, taking his receipt therefor.

Duties of the Vice President.

Sec. 3.—In the absence of the President his duties shall devolve upon the Vice President.

Duties of the Secretary.

Sec. 4.—The Secretary shall record the proceedings of the Association and of the Board of Directors. He shall keep a list of the members, collect all the moneys due the Association (other than the legislative appropriations), and shall record the amount with the name and postoffice address of the person so paying, in a book to be kept for that purpose. He shall pay over all such moneys to the Treasurer, taking his receipt therefore. It shall also be his duty to assist in making the program for the annual meeting and at the close of the said meeting compile and prepare for publication all papers, essays, discussions, and other matter worthy of publication, at the earliest day possible, and shall perform such other duties pertaining to his office as shall be necessary.

•

Duties of the Treasurer.

Sec. 5.—The Treasurer shall, before entering on the duties of his office, give a good and sufficient bond to the Directors of the Association, with one or more sureties, to be approved by the Board of Directors, which bond shall be conditioned for a faithful performance of the duties of his office. He shall account to the Association for all moneys received by him by virtue of said office and pay over the same as he shall be directed by the Board of Directors. No moneys shall be paid out by the Treasurer except upon an order from the Board, signed by the President and countersigned by the Secretary. The books of account of the Treasurer shall at all times be open to the inspection of the members of the Board of Directors, and he shall, at the expiration of his term of office make a report to the Association of the conditions of its finances, and deliver to his successor the books of account together with all moneys and other property of the Association in his possession or custody.

Duties of the Board of Directors.

Sec. 6.—The Board of Directors shall have the general management and control of the property and affairs of the Association, subject to the By-Laws.

Four members of the Board shall constitute a quorum to do business.

The Board of Directors may adopt such rules and regulations as they shall deem advisable for their government, and may appoint such committees as they shall consider desirable.

They shall also make a biennial report to the Governor of the State of the expenditures of the money appropriated to the Association, and arrange the program and order of business for the same.

Election of Officers.

Sec. 7.—The President, Vice President, and Board of Directors shall be elected annually by ballot at the first annual meeting of the Association.

The Treasurer and Secretary shall be elected by the Board of Directors.

The officers of the Association shall retain their offices until their successors are chosen and qualify.

A plurality vote shall elect.

Vacancies occurring shall be filled by the Board of Directors until the following annual election.

Membership.

Sec. 8.—Any person may become a member of this Association by paying the Treasurer such membership fee as shall from time to time be prescribed by the Board of Directors.

Quorum.

Sec. 9.—Seven members of the Association shall constitute a quorum for the transaction of business, but a less number may adjourn.

Annual Assessment.

Sec. 10.—One month prior to the annual meeting in each year the Board of Directors shall fix the amount, if any, which may be necessary to be paid by each member of the Association as an annual due.

Notice of such action must be sent to each member within ten days thereafter, and no member in default in payment thereof shall be entitled to the privileges of the Association.

Amendment of By-Laws.

Sec. 11.—These By-Laws may be amended at any annual meeting by a vote of not less than two-thirds of the members present. Notice of the proposed amendment must be given in writing, and at a public meeting of the Association, at least one day before any action can be taken thereon.

PROCEEDINGS
OF THE
30th ANNUAL REPORT
OF THE
Illinois Dairymen's Association

Held at Greenville, Illinois, January 5th, 6th, and 7th, 1904

The Illinois Dairymen's Association met in annual session at the Circuit Court Room, in Court House, at Greenville, Illinois, January 5, 1904, at 1:30 P. M.

On account of lateness of train, the convention was opened by the Vice-President, Irvin Nowlan, the president being detained.

PRAYER.

By Rector Wright.

O Lord, our Heavenly Father, we are here assembled to greet the dairymen of the State of Illinois in convention. We bow in Thy presence and ask Thy blessing to rest upon them. May their work be successful here, and that the papers and addresses given may go forth throughout the state to the dairymen helping them in their respective duties.

May the farmers who have cows under their care be kind to these dumb animals that form such an important part of our country's food, help them to realize that gentleness is necessary for their welfare.

Bless each one that attends this convention and may they receive great benefit from it. We ask it in Thy name. Amen.

ADDRESS OF WELCOME.

By the Mayor of Greenville.

Mr. President, Ladies and Gentlemen:—

I wish, in the name of the citizens of Greenville, to welcome the Illinois State Dairymen's Association to this city. I assure you you will have good accommodations and we will treat you well while you are here.

We have one industry here that we are proud of and that is the milk condensing business we are carrying on here.

We feel sure that when you go away you will think that Greenville has treated you right and will want to come again, and we hope you will and will assure you another hearty welcome.

RESPONSE TO ADDRESS OF WELCOME.

By Irvin Nowlan, of Toulon.

It has been a great pleasure to this gathering of the best people of the best state, to listen to the cordial, hearty and eloquent address of welcome, so sincerely expressed by your Mayor,

who, in a very gracious manner, has voiced the greeting of hospitality and good cheer extended to the Illinois State Dairymen's Association; we accept them as a recognition of the good work of our Association in its efforts to develop one of the leading industries of the state.

The people of Greenville are to be congratulated upon securing this convention and we cordially invite them to our meetings, to take part in the discussions and to aid in our work.

This assemblage of intelligent and progressive Dairymen gathering from all sections of this great state is the most eloquent that can be presented to the citizens of Greenville and surrounding districts, of our high appreciation of the preparations made for this meeting.

We all know that experience is a dear school, so let us here, hear the experiences of others, that we may profit from them.

We learn by failure as well as by success, so let us have free interchanges of opinion.

Through our mistakes we learn the truth; we learn by the mistakes of others as well as by our own.

We are here to share with you what we have learned of this business; we are also here for the purpose of increasing our own knowledge, realizing that in a comparatively short time that you have successfully established the Dairy Industry in new and untried fields, and have advanced it from its crude form to the most modern.

We congratulate you on these things and trust our efforts will meet with your approval and be deemed worthy of your support, that when we come to part at the close of these sessions we may feel strengthened and encouraged and feel glad for having been here.

I am glad to boast that in these meetings, there comes together the farmer and the creameryman, the merchant and the shipper and all that are connected with the business, and here we can reach a pleasant beneficial understanding.

Today knowledge is the power by which all business is driven; the dairyman may be urged to fertilize his farm, and while he

thus replenishes the soil, he must not neglect to fertilize his mind, that it too may cause germination and bear fruit.

In dairying you have the scientific branch of farming, for it improves the farmer as well as the farm; it is an incentive to higher things "For he who finds in his vocation only a means of living becomes a joyless drudge and his vocation, stagnant drudgery."

Too few dairymen manage their dairies upon business principles, in the selection of their herds, in the feeding, and in the care of the product, little or no attention is paid to the cost of production; every dairyman should keep as close watch upon the cost of production as does any business man.

We must apply business principles to our business, and with no existing rivalry or jealousy between any of the dairy sections; the good reputation of our products in the markets of the world, and an united effort to prevent fraudulent goods from entering markets sacred to an honest industry, I bespeak for the dairy business of Illinois a highly prosperous and successful year.

I assure the speaker and his constituents that the cordial spirit of the welcome is most highly reciprocated.

PRESIDENT'S ADDRESS.

Joseph Newman, Elgin, Illinois.

Mr. Chairman, Ladies and Gentlemen.

The year 1903 just passed, was one of the most successful the producers of milk, the real dairymen, have ever enjoyed. The weather man, the laws, and the consumers all seemed anxious to add their part in making the year a happy one for the dairyman. Even the dealers, the milkmen, last May and June were so anxious for your goods, they filled every available freezer

at high prices, and now they are repenting of their rashness. They did not calculate on the large fall make. If you remember, the pastures in August, September and October were green, like unto June, and milk was made for less money than for many years past. Fortunate was the man who had contracted his milk at prices usually prevailing in the fall. We are now feeling the effect of this surplus of freezer stock, and the price on fine creamery butter is five cents lower per pound than a year ago at this time. Hence it behooves you "in the time of prosperity to prepare for adversity." I do not use this quotation in an alarming sense, but want to make it strong enough that an intelligent man will heed and weigh it carefully. I cannot think of a good dairyman who is not intelligent, so every one of you think it over carefully.

You must do something yourselves to meet lower prices for your product in the summer time, which, as I view the market horizon, seems inevitable, and how to do it and still keep the net profit as large as in 1903, is the problem before you, the producers.

You will have to call to your aid the most scientific agricultural knowledge to be found. This can be had from your own college at Champaign, but don't stop at that, take two or three agricultural papers and be sure one of them is Hoard's Dairyman, and read thirty minutes every day for a year. After that you will get "Henry's Feeds and Feeding," the Dairyman's Hand Book issued by the National Dairy Union and Cobb's book on dairying, etc., etc. You will, by doing this, renew your interest in your farms, and your neighbors will wonder how you got those new fangled notions about handling your soil to preserve it and still give you large crops, how to care for those crops so that they can be fed in the most palatable form, and then decide which of the young stock is best to raise. These are all wonderfully interesting subjects, and the young people on the farm will stay there if you will interest them in all the different departments. Don't be afraid to talk over scientific dairying with them. You must not be afraid of this word "Science." It is simply truth, knowledge, used as true or right knowledge of dairying. Give

them good books on agriculture. They will dig some things out of them that will surprise you and benefit both you and them.

It is becoming absolutely necessary for you to adopt right methods to produce your goods at the least possible cost, for the export price will cut more of a figure this next summer and we must prepare for it.

The world buyers are no respectors of nations. They buy from those who sell the best goods the cheapest. Russia is trying to control the markets with an iron hand in the far east. We must work for an open door to all markets of the world. If she, by her National railway refrigerator service and subsidized steamship lines has opened up Siberia to the world's markets, we shall eventually need to meet the competition, and I have no fear but what the American dairymen will meet it, and successfully too, if we only prepare for it.

The World's Fair at St. Louis is very near, and the exhibit of dairy products from this state should be equal, or surpass that of any state in the union. To that end a committee composed of two from this Association, two from the Chicago Butter Board, two from the Elgin Board of Trade, and Mr. Glover of the Experimental Station have met with our State Fair Commission to aid them in making a suitable display. We have asked the commission to give this committee charge of the Illinois exhibit, but in this, so far, we have not been successful and still hope for a favorable decision. In any event, every dairyman should do his full duty in aiding the state display.

The hand separator has become quite a factor with the dairy farmer, and when intelligently used is a good investment. The pastuerizer and ripener are finding large sale, and by their use the American creamery is turning out a butter similar to the Danish product, which has always been the highest priced butter on the English market. It is milk in flavor and a good keeper.

It must be understood that milk produced under ideal conditions, such as the Gurler certified milk, and kept cold, is not aided

by pastuerization, and it is the work of all educational departments to influence and aid our dairy farmers in bringing up the standard of milk produced in this state so that "Illinois milk" and its products will be synonymous with cleanliness, purity, and quality, which will mean large consumption and higher prices.

This Association is trying to do its part(by pointing out the weak places, and the state government has done its part in placing at the disposal of the dairy department of our Agricultural College, sufficient funds to produce good results. We know the money spent in field work is money well invested, and the team composed of Mr. A. J. Glover and Mr. Carl Lee are meeting with great success. We hope the money spent at the experiment station will prove as great a blessing to the dairy farmer. I expected field work would be done in this section of the state before this, but for reasons which they probably will explain to you, the Powers that be have not seen fit to have it so.

At the Station, Mr. W. J. Hart, who has lately come to us from Canada, has a splendid reputation, and if given the proper backing, should turn out some first-class dairymen, as well as carry on experiments that will prove beneficial to all dairymen. We need the work of the College and Experiment Station and must work in harmony with them for the good of all. But at the same time we must not be afraid to point out the weak places, fully believing those in charge will correct them, to the end that the greatest good will come to the many through a wise use of the public funds.

I understand a movement is on foot to have a correspondence school of agriculture in connection with our college at Champaign. I hope Dean Davenport will succeed in having this established. It would be a boon to thousands of farmers who have passed the school age, and greatly assist the workers in the field in carrying dairy and other agricultural knowledge to men and women on the farm. It would so interest them in the college work that more young people would take the College course at the College.

I must commend the work of the Farmers' Institutes and all persons interesting themselves in developing the study of agriculture among the young people.

Henry Wallace says the College, the Experimental Station, the Farmers' Institute, the State Fair and the Agricultural papers are the five great forces that are working together for the development of agriculture. I quite agree with him, believing he includes the idea of the common school as a part of the college, and all five should be fostered and brought up to the ideal, as a weakness in one would be a calamity to all.

One of the most important is the last, for of what use is the knowledge gained at the first four without the means of dispensing it to the people on the farm. The bulletins are well enough, but the weekly Agricultural Paper will keep the important things before them all the time. Read "Hoard's Dairyman" for a year, and see from the questions asked, how many times during that period, about the same question will be asked and answered in the year. It is probably this willingness to repeat a good thing has made it the greatest dairy paper in the world.

With these five great forces working in harmony with the U. S. Department of Agriculture, what should be the work of this Association for the future in our particular line of agriculture? We can all agree that the past can be improved upon, for while in the past, with the aid of the National Dairy Union, we have done considerable, we can do more. All dairymen and their special lines of work, whether breeders of dairy cattle, the producers of milk, of its products, the manufacturers, the dealers, the carriers of dairy products, all concerned in dairying in any way, should come together and advise with each other more than they do. In the past, when we have sent the information gained at our annual meeting to the dairymen on the farm in our annual report, and the directors hold say, two meetings, the funds at our disposal are exhausted. We have never asked the legislature for anything different. I fully believe we should. What we need is more life, and the first thing to consider is the matter of Secretary. The funds at our disposal should be large enough to insure his

whole time at work among and for the dairymen. This would be the beginning of a new era for the Illinois Dairymen's Association, and would be of immense value to those engaged in dairying in this state. A large portion of the work done in the past has been related largely to butter making, the field of city milk supply being hardly touched on. We have done a little in this line the past year, sufficient to show us that the time is at hand when the dairy laws of the state should be administered by some one clothed with police power, so that those men who will not produce and deliver milk suitable for human food, could be driven out of the business. Why not a permanent secretary and assistant in connection with the States Attorney? The President should be a man well versed in dairying, and to me the logical head of this Association is H. B. Gurler, of DeKalb, a man who has climbed to the topmost round of producing the ideal milk for human food, and is also acquainted with the many disadvantages the ordinary dairy farmer labors under and which must be taken into consideration when laying out the future work. Of course the secretary is the one on whom the burden of the work must fall, and it will depend largely upon him as to the success or failure, the much or little good the Association is to be dairymen of the state. We cannot buy much time of an intelligent man for \$200 which is all we can set apart for that under our present appropriation. The directors coming from different sections of the state, do all they can in their respective localities, and as meetings cost considerable, do not get together as often as would be beneficial to the Association.

In deciding on Greenville as the place for the 30th annual meeting, we have gone from the beaten path of alternating between the north, or dairy section, to the middle or southern part of the state, by coming south twice in succession. We hope and believe this meeting will prove the wisdom of our decision. This section is being developed in dairying by the markets afforded then by the creameries, and St. Louis market.

Our program is made to aid in this future development of the dairies already established, to a higher standard of cleanliness, and to show to others that dairying is the best side of agriculture, and to a greater or less extent should be carried on every farm. It will raise the productiveness of the farm in a natural manner. The growing of the young stock will interest the family, and all will tend to raise the standard of intelligence of those around you, because to be a true dairyman you must be vigilant and studious, reading the great daily papers, your agricultural weeklies, thus keeping up-to-date on all farm work. These are strenuous times. Read your bible daily for relaxation and in it you will find that dairy products were looked upon as being of the best and first fruits of agriculture.

THE CARE OF COWS.

Mr. Tallie Defrees, Greenville, Ill.

When I received a letter in the early part of the winter, from Mr. Geo. Caven, asking me to prepare a paper to be read before the Illinois Dairymen's Association, I was surprised, very much elated and just a little scared.

I mentally decided that I was wholly incapable of such an undertaking. However, upon conferring with Mr. Latzer, he assured me that the members of the Illinois Dairymen's Association were an amiable, forbearing lot of fellows, very much like men of Bond County.

With this assurance, I accepted the invitation. Since that time I have been trusting to providence. The subject assigned to me is, "The Care of Cows," and in treating this subject I shall endeavor to tell you the actual practices and methods employed in the caring of our own herd, together with such hints as our experience and observation have suggested to us.

I have been caring for cows ever since, almost before, I was able to care for myself. I have cared for cows when I didn't have a care in the world save the care of these cows. And, again, I have cared for cows, when the cows' cares were no cares to me, and when I didn't care whether the old cows were cared for or not.

But today the care and comfort of my herd is my chief and greatest concern.

I presume that you will grant me that the object in caring for your herd is to derive profit. You will also grant that the profits derived will depend upon the care given. It becomes apparent at once then, that the success of your herd will depend upon the attention it receives.

The first important item that suggests itself to my mind, is the disposition of the person who works with the herd. One who is cross-grained and rough should have no place in a herd of dairy cows. Gentleness and kindness are absolutely essential and necessary qualifications of a dairyman.

The herdsman should have the confidence of every individual in the herd. He should be able to handle and caress them at any time and place, and to pass among them without exciting the least curiosity or uneasiness.

In fact, he should be a part of the herd, noting the varying moods and quick to discern anything abnormal.

To properly care for your herd, there are a number of things which you must necessarily have, and a number more that are quite convenient to have.

Among the necessary things may be mentioned, barns, feed, water and a large supply of good judgment.

The barn should be large; it should be warm, convenient and well ventilated. The storage capacity ought to be sufficiently large to hold the entire winter's feed.

It is a troublesome and unpleasant task, when one is compelled to haul feed during the winter months, even on the brightest days, and it usually happens that the very worst days are the ones on which you find your mow to be empty.

Not only this, there is another and more important reason. On all feeds stacked in the open fields, there is an actual loss of from one-tenth to one-half of the bulk, depending on the nature of the season, and the manner in which it is stacked.

This is an outright loss. Add to this the fact that the remainder will be inferior in quality to that stored in the barn at harvest time, and you will readily see the importance of a large storage capacity.

The barn should be warm—the warmer the better. The basement barn is the most suitable for dairy purposes. However, if you are not so fortunate as to possess one you can make the barn you have snug and warm at a small cost, by doubling the walls or lining with thick building or tarred paper. Doubling the walls is to be preferred, however, since then they can be whitewashed.

Ventilation should be thorough, pure air being quite as essential to the health of the animal as pure water.

The stable should be kept clean, the walls should be white-washed and the ceiling swept free of dust and cobwebs.

Disinfectants should be used freely. The odorless varieties, such as air slacked lime and copperas are to be preferred, however, since by their use there is less danger of the milk being tainted while in the stables.

Throw open the doors and windows and allow the sunshine to enter upon every possible occasion, for sunshine is the greatest germ destroyer agency we have.

On the question of water there is much to be said. The dairy cows require water in great quantities, at regular intervals, and of the proper kind. She should be accustomed to one watering place and one kind of water, for if changed about she is apt to drink less than her portion or none at all which invariably, causes a decrease in the flow of milk. When and where possible, I favor watering direct from the well or springs. The results will more than justify the expense of time and labor, for when you depend upon a small stream or pond for your water supply, especially one that has no means of being replenished and puri-

fied, except by the uncertain rainfall, it is too often the case that you have a stagnant pool instead of the pure fresh water that you should have. Impure water is not conducive to the health and well-doing of a cow, any more than it is to that of the human being.

I have found by observation that cows, even in the heat of summer, are partial to warm water. By warm water I mean water at a temperature of 70 degrees F. Knowing this, then, how unprofitable it would seem to force them to drink water at a temperature of 32 degrees F. The cow is compelled to raise the temperature of every drop of water she drinks to 98 degrees F. For every degree of this, a certain amount of feed is required. Thus, much feed which should go to the production of milk is consumed in supplying animal heat.

Water drawn direct from the well will vary in temperature from 45 to 60 degrees F. Consequently a cow given ice water is compelled to heat an average of ten gallons of water daily to a temperature 20 degrees in excess of what she should do.

On the larger farms, where wind pumps are in use, necessitating the use of large watering and reserve tanks, the use of the tank heater is an indispensable necessity.

A cow coming out of a dry, warm barn on a cold blustery day is not apt to drink very much water, but if she finds the water warm after the first few swallows, instead of turning away, she will continue until she drinks her customary portion.

Winter is the time when you need to exercise your very best judgment in the care of your herd, if you would secure the best results.

In summer the cows will regulate the amount of her own feed. She will choose the proper hours of feeding, the proper hours for watering; she will shield herself from the excessive heat and sudden storms; she will keep her hair clean and glossy and she will make her own bed. In winter all these cares will devolve upon you. We have previously stated that the barn should be warm; it should also be dry. No defects in drainage should be tolerated. The floor upon which the cow stands should

be just long enough so that the droppings will fall into the gutter. With every precaution, however, some of the droppings will still fall upon the floor. These should be raked into the gutter the last thing at night before leaving the stables, the first thing in the morning upon returning and again after the morning feeding is done, before the cows begin to lie down again. For this purpose a blunt stiff handled hoe should be used.

While no doubt it would be better for a cow to stand upon a soft dirt floor, it is nevertheless necessary that the floors should be of wood or cement.

Cows are continually stepping, moving and shifting from one foot to the other and with a dirt floor the stables would be clouded with dust at all hours. The objection to the hard floors can be largely overcome by supplying a liberal amount of bedding to each cow. It takes away harshness while standing and makes it warm when she lies down.

Another advantage in using bedding freely is, that as it falls into the gutter it absorbs the liquid manure and preserves it until it is hauled out to the fields. The manure should be removed from the barn at least once a day. No particles should be allowed to lay in the aisles behind the cows to be carried into the feeding aisles on the feet of the milker. No other animal is more dainty about her feed than a well bred dairy cow.

During stormy or extreme cold weather, the herd should be kept in the barn excepting the time required for watering and upon many first-class dairy farms, there are appliances for watering the herd in the barn, and for days at a time the herd does not taste a breath of frosty air. It is quite necessary, however, that the herd should have all the freedom and sunshine possible. It is not the cold that does the harm to the milk pail, it is the rains and winds. The weather may be very cold, yet if it is still and the sun is shining, the herd is much better off out of the barn.

For winter run of a herd, there is nothing quite so valuable as a small, hilly woods pasture. Here on most days around the feeding racks, and lying on the sunny slopes of the hills, the cattle will be found resting, lazy and contented. The sun's heat

is here intensified and the force of the winds broken rendering it pleasant on many days, when anywhere else it would be wholly unfit for the herd to be out.

Any one having a dry well-drained lot can provide a splendid out door run at small cost, by building a tight board fence five or six feet high on the north and west sides. It will be a real pleasure to you to see the herd, on windy days, lying close up to this fence in the full force of the sun. It will not only be a pleasure, it will be economy. In fact anything that provides comfort for your herd is economy.

In the feeding of your herd, judgment and careful attention are required. Feed liberally, but by no means overfeed. Feed according to the conditions of the cow, bearing in mind her likes and dislikes, and the object for which you are feeding. If the animal is in poor flesh, feed a flesh producing food until she is in proper order, then gradually substitute the full milk ration.

An occasional change in the feed will be appreciated by the herd, for when confined to a single ration you will frequently find a cow indisposed, sluggish and off her feed. This can be avoided to a large extent by changing the feed at such times as your judgment and the action of the herd would suggest. Above all things feed with care.

The amount must be determined by the nature and needs of the cow and the offalls will usually indicate the condition of the cow.

The mangers and feed boxes should be kept clean, and any refuse left during the day should be removed. The feed boxes should be inspected after each feed, and should a cow leave a portion of her feed, it should be removed and the box thoroughly cleaned before the next feeding hour, when she should have a smaller and different ration. It is only an experienced feeder can keep his herd of dairy cows fed up to the limit during their entire milking period, for he knows the moment a cow's mess is placed before her whether she is rational or indisposed. There is a saying among old Germans that "The eye of the master fattens his cattle." With a little changing this could be made

to read, "The eye of the master feeder fills the milk pail." He is in touch with the herd at all times, knows all its needs and just how to supply them.

The importance of the milking hour should by no means be overlooked. There should be a regular stated hour for milking and failure to milk at this hour should not be permitted. The morning and evening hour of milking should be the same. Failure to observe this rule is a very common error and one that is very detrimental to the cow.

On many farms during the summer months the milking is done at four o'clock in the morning and at seven o'clock at night, while during the winter months, it is done at seven o'clock in the morning and at four o'clock at night. Such a system is all wrong. At one milking you get a great quantity of milk, and the next you get a very small amount. Fifteen hours between is entirely too long for a dairy cow of any worth to go without being relieved. The udder is apt to become too feverish and caked, and the milk to be stringy.

Everything should be reasonably quiet during the milking hour; talking should be avoided, and someone has suggested that cats, dogs and strangers should be excluded at least during this hour.

Cows should be milked in the same rotation and invariably by the same milker. It is especially important that a cow be milked by the same person, and a change should be made only when absolutely necessary. No two persons milk exactly in the same manner, and a cow will recognize a stranger even before he begins the actual process of milking. Not only this, there is a particular way in which every cow can be milked to the best advantage. With some you must begin very cautiously and gradually increase the speed and pressure. Others you can milk as fast as you wish from the very start. With some, on account of the shape of the udder, it will be found necessary to milk certain teats together; with others it will make no difference. These and other things the new milker must learn before he can properly milk the herd.

One of the important items in the care of your herd is to look after the details. It is the small things that count in dairying as in other lines of business.

The herd should have access to salt at least twice a week. A better way of supplying salt is to place a spoonful in the food every morning. When given free access to salt, some cows will consume more than they should, while others will not eat a sufficient amount. By placing it in the feed, you may be certain of the amount each cow is getting.

The dry cow should have careful attention. Do not neglect her because she is not paying for her keep just for the time being. She is simply taking a vacation, a much needed and desired rest, and when she returns with a calf by her side, she will tax the capacity of the milk pail to the utmost, and you will be glad that you didn't neglect her. To insure her well doing at calving time, she should have a liberal amount of soft feed once a day, in addition to all the clean, bright roughage she may wish. A feed composed of five parts bran, five parts crushed oats and one part oil meal will be found very satisfactory. Just how many times a day a cow should be fed to secure the best results is a question open to discussion. We feed our herd never less than four times a day and often they have feed placed before them six times during a single day.

I feed my cows much on the same principle that I do my hogs. I try to feed so that they will appear satisfied at all times, and still be ready for just a little more feed.

The udder and teats of all cows should be kept clean and soft. Special attention should be given to prevent the teats from becoming chapped, rough and warty. During bad weather, the teats will become rough and chap seemingly without cause. This can be prevented by moistening with vaseline, carbolized lard or any antiseptic dressing. Warts can be removed by clipping with a sharp pair of scissors, and burning the roots of them with a stick of lunar caustic. The wound should then be dressed daily until cured.

After listening to a paper on "The Care of Cows" one might be inclined to think that the life of a dairyman is all care. Some people actually find it so, aside from the profits derived. However, I feel safe in saying that the best dairymen in the State of Illinois are dairymen not on account of necessity or obligation, but by reason of choice and preference.

For my part, I find a great pleasure in looking after my herd. It is a pleasure to look down the long feeding aisles where every cow is alert and busy with her feed. When by chance you go into the stables late at night, what is prettier than that long row of cows, lying in the soft bedding, dry, warm and comfortable.

And again, when in the golden hours of summer, seeking rest and quiet, you walk down through the old woods pasture, where the bluegrass covers your feet at every step; where the shade of the ash, the oak and the elm of the hillsides is cool and inviting; where the winds whisper and sing of joys undenied; where the flowing, rippling stream before you reflects the image of birds and moving tree tops, and the very air is balm and incense; the joy of this scene is made replete only when you see the cattle grazing on these hillsides and drinking beneath the branches of those reflected treetops.

DISCUSSION.

Mr. Cobb. Q:—Regarding the cost of his daily ration at the present time. He mentioned oats and bran as a part of his ration and with me oats and bran are prohibited on account of cost.

A:—Only for dry cows to insure well doing.

Q:—Do you feed grain to your cows that are going to freshen?

A:—Crushed oats while dry.

Q:—Nearly all milch cows are troubled with fever if fed grain just before the cows freshen?

A:—We have been handling cows on the farm three years and have followed that practice and never had a case of milk fever yet. We feed a small amount not a large amount.

Q:—What is your ration for your full milkers?

A:—It consists of roughage, ensilage, cow peas, clover and fodder in the lot. Grain ration consists of half gallon of bran, half gallon crushed oats, half gallon crushed corn.

Q:—You don't know what that weighs?

A:—No sir I don't exactly.

Q:—You feed ensilage?

A:—Yes sir.

Q:—And deliver your milk to the condenser?

A:—Yes sir.

Q:—Mr. Newman. I am glad to hear it; using ensilage and delivering milk to the condenser.

Mr. Cobb:—What are we going to do about it?

Mr. Newman:—We are going to give this condense factory a gold medal.

Mr. Cobb:—There are several of them doing that same thing here.

Mr. Newman:—Yes sir, I am glad to hear it.

Mr. Cobb:—It is prohibited up north.

A member:—We have fed and used it for eight years now and no complaint whatever.

Q:—To the Highland Condenser here?

A:—Yes sir.

Q:—And made into condensed milk into cans?

A:—Yes sir and no complaint about it.

Q:—What state is your corn in when you put into the silo?

A:—A little harder than oats in ear.

Mr. Newman:—Is this feeding ensilage advocated by the Condensed Milk Company itself.

A:—No sir it is not, only to those who know how to feed it.

Mr. Newman:—That is the reason up there, they are afraid to open the door. Some of their patrons would not be clean enough in feeding it, and they are afraid to let any one feed it.

A:—Those are the instructions we had before we built our silo.

Mr. Newman:—I hope you will live up to it.

A:—We limit our feeding to once a day, a common bushel basket not quite full, 20 pounds a day directly after milking in the morning.

Q:—Will you explain the restrictions that the Condensing Company has, or the instructions given you for feeding ensilage?

A:—I would rather not answer that question in regard to feeding ensilage or the instructions given. Feel under obligations somewhat to the condensing people and would rather not answer.

Mr. Cobb:—We are glad to know that there are condensers that have come to a common sense idea on this ensilage question. It has been thoroughly proven that ensilage fed cows milk is just as pure and wholesome as any other feed.

Mr. Clover:—Do you know how long this condensed milk is kept after it is canned. Do they keep it a long time or ship it for immediate consumption?

A:—Keep it a long time; they keep it indefinitely.

Mr. Lindley:—In regard to this ensilage question. The people here are trying an experiment in the way of milk production and testing the ensilage and they hope to have some very good results from it. They feed a well balanced ration and a small amount of silage. They are finding out just what silage will do, if entire silage it would spoil and ruin that condensed milk or sterilized milk, and until they find just how the condition is they will not permit the free use of silage.

Mr. Glover:—In regard to this, I have questioned considerably the superintendents of the Gail Borden Company in regard to this matter. They do not hesitate to claim that if silage is fed correctly that they can make condensed milk that would keep quite a while. But for a long time they never had been able to find farmers who took enough care of the silage so they could make milk that would keep for a long time. In Michigan they operate factories that Secretary Alger was interested in that use milk made from silage. That was shipped immediately to the

army and we all know they had considerable trouble. I am one of those people who believe the Borden Company know how to handle milk and if they could use silage milk they would. It is the fault of the man who feeds it. If silage is allowed to lay about the barn and gets bad the milk will be tainted. If ninety per cent of the men fed correctly and ten per cent did it incorrectly it would spoil the milk and the trouble would all be with the ten per cent who fed incorrectly.

A:—There are three farms that I know of that are using silage. There are five silos in this community and two of them are not using them for dairy purposes, but three farms are using silage for dairy purposes and that is all I know of within this radius.

Mr. Newman:—I was pleased to hear of this in the Highland Condensed Milk Company. Good things come slowly, and you know in this state, or any other state for that matter, there are farmers and farmers. Some will feed according to rules and some are careless and condensed milk cannot take any chances. Some good will come out of it and we will all reap the benefit.

By the President:—The next paper we have on the program. We have had the care of cows; now we will have the "Care of Milk," by Mr. Clarence B. Dorsey, of Moro, Ill.

THE CARE OF MILK.

By Clarence B. Dorsey, Moro, Ill.

In considering this subject, it seems best to take up only those points most needed by the dairyman who is producing milk for city supply, for the creamery, for the condensery or for farm buttermaking. We will leave out scientific details and discuss

only those phases of the care of milk that the producer must know in order to produce clean, pure milk.

Milk is a human food. We have a perfect right, therefore, to insist that milk be clean, pure and wholesome. Would you sell your neighbors meat, when you knew it was covered with filth or partially decayed? Is it any better to sell milk that is filthy with dirt from cow, stables, or feed; or milk that may produce many cases of typhoid? A man's duty to his fellowmen demands that he do all he can to have milk clean, pure and free from disease germs. Neglect in these matters often goes so far that much sickness and even death results.

Before going into the practical details of producing good milk, it will be best to discuss briefly the subject of bacteria. Bacteria are exceedingly small one-celled plant bodies. They are so small that with a microscope magnifying 500 times they are hard to distinguish. They require fluid, or semi-fluid bodies in which to live, and milk is one of the best mediums for bacterial growth. Bacteria multiply very rapidly—under proper conditions one germ will develop into millions in a few hours. They develop best at a temperature of 80 degrees—100 degrees, or practically the same temperature at which milk comes from the cow.

There are many forms of bacteria, each having a certain function to perform. The lactic acid produces lactic acid in milk, and lactic acid in milk means sour milk. The germ diseases, such as typhoid and tuberculosis, or consumption, are often transmitted to the human system by their bacteria in milk. So numerous are the various forms of bacteria, and so great their work, that the dairy industry may be said to depend on these various forms of bacteria. The preservation of milk, the successful manufacture of butter, cheese and condensed milk, all have a great deal to do with the questions of bacteriology.

The care of milk begins with the care of the cow. If the animal is out of condition, or is not properly fed or cared for, she is quite likely to show the effects in the quality of her milk. Where a cow is overfed or underfed, and the digestive system gets out of order, the milk will often be tainted. Turnips, fresh

green rye, and other similar foods, if not properly fed, will taint the milk.

A feed, such as turnips—likely to produce a strong flavor in the milk—should be fed just after milking. When outing cows on rye pasture in the spring, allow them to stay on the rye for a few minutes only the first day. Lengthen the time gradually each day. Such a plan should not derange the cow's system nor seriously affect the milk.

To keep the milk clean, both the cow and her stable quarters must be clean. She must have plenty of good bedding. The dirt from her flanks and udder should be brushed off before milking. The milker must be clean in clothes and person. The milker's hands are the most common source of filth in milk and should be carefully watched. Any feeding that will create a dust should be done either before or after milking. Dust particles carry many bacteria and thus often injure the milk.

The ventilation of the stable should be such as to carry out foul air. Bacteria live and thrive in the warm manure of the stable. Thus manure becomes a source of danger to the milk. Odors from manure and from certain feeds, such as silage, lying in the stable, are readily absorbed by the milk and thus taint it.

The best strainer is a wide-mouthed affair, the bottom of which fits closely into the mouth of the can. The milk should first pass through a comparatively coarse metal or wire strainer, and then through a fine cloth stretched tightly across the bottom of the strainer.

Milk should be cooled as soon as drawn. It must not stand for a long time in the stables after being drawn. The longer it remains in the stable the more likely it is to retain the foul odors of the stable.

In warm weather, if milk is not cooled promptly the bacteria develop very fast and quickly produce souring. A number of good milk coolers are now made. Generally speaking these coolers do their work well. The milk flows in a thin film over a metal surface cooled by water or brine on the inside of the vessel. This allows the milk to be both cooled and aerated in a very short

time. If you do not have this cooling apparatus, the four gallon cooling can is the next best thing. Whatever means is used in cooling and aerating the milk, it must be borne in mind that the work must be done promptly after milking. If cooled in cans it must be stirred until the temperature is considerably reduced. If the cans do not stand in cold, flowing water, or ice water, then fresh water will have to be added often enough to keep the milk cool. Bear in mind your object in cooling milk, bacteria do not thrive in cold milk. Cool the milk promptly and keep it cool, and it will not easily sour. Never mix warm, fresh milk with old milk, particularly in hot weather.

Watch the weather closely. The most difficult time to handle milk is during warm damp weather. Why? Because bacteria thrive best in warm, moist weather. Therefore, on a damp, sultry day there are more bacteria than at other times. The milk not being so cool as it should be, the conditions are good for it to sour quickly.

Keep a dairy thermometer; keep several of them. Don't simply guess that the water or the milk is cool enough. Put the thermometer into it and be certain. If it is at all possible, milk should be cooled to 45 degrees. It must not go higher than 60 degrees, for it will not keep well in the summer weather.

Be thoroughly clean in all your dairy work. Over in the Polk Dairy barn at Greenwood, Indiana, hung the motto, "Cleanliness is next to Godliness." There is hardly a better place than the dairy for that motto. Cleanliness is not only necessary from the standpoint of decency, but it is simply necessary in dairying. The milk room, water tanks and dairy utensils must be kept clean. Never allow water to stand on the floor for any length of time. Keep the water tank free from filth of all kinds. All dairy utensils, such as cans, pails and separator parts, after being used should be scoured with hot water, brush and washing powder. After this they should be scalded and rinsed and then placed so as to thoroughly drain and dry. Sunlight is an enemy to bacteria and if sunlight can reach the interior of cans and pails, so much the better.

I repeat—Be clean in all your dairy work.

While the milk is being hauled from the farm to the receiving station, the cans should be covered with a blanket or a canvas to protect from mud and cold in winter and from heat and dust in summer. Remember that the summer sun shining on a can of milk will quickly raise the temperature; hence the need of thorough cooling before leaving the farm.

“Everlastingly at it” must be the watchword of the milk-producer. Milk will sour or taint so quickly that it demands the closest attention to do the work right and be ready for emergencies.

Yet dairying pays well for all this exacting work. Our farms will yield larger returns under dairying than from any other line of farming. Dairying is yet in its infancy and there are plenty of opportunities for the man who will do his work well. It pays to be careful with your milk.

People are becoming more exacting in their demands for good dairy products, and also more willing to pay for good quality in dairy products—a sentiment which finally benefits the man who believes “That whatever is worth doing at all is worth doing well.”

DISCUSSION.

Q:—You speak of feeding turnips to cows. My opinion is that it should not be done at all?

A:—I used that more as an example than as advising they should be fed. It is a feed that is used in the north more than it is in this section, and that is one good example of a feed that will taint milk. I used it more as an example of the general class of feeds. We have fed them some.

Q:—You made the remark that they should be fed just after milking. I presume that it would not taint by next milking time?

A:—Yes sir.

Q:—I tried turnips enough to know they will taint?

A:—Yes sir.

Mr. Cobb:—Mr. President, one of the most successful dairymen of Wisconsin was called Turnip Hyatt. He was one of the pioneers. He demonstrated thoroughly that turnips were a very valuable food. I tried myself one time in feeding them. I was running a milk route, and one of my customers said she could tell whether turnips were fed, from the cream in her coffee. I fed the tops and all after milking and in all kinds of ways. I sold milk and it was not detected. We depended on turnips in the fall and beets in the fall and we fed them. I would feed them today if I had no silo.

Mr. Glover:—I cannot agree with Mr. Cobb in his statements. When cows eat turnips before milking they taint the milk. I have visited many a cheese factory during my time as instructor in Minnesota. We worked for days to eradicate the taint of turnips in cheese. I know it will taint and it appears after the milk has been warmed up and gone under the fermentation in making cheese. You may not notice it when cool, but after a while fermentation begins and shows the different marks in the milk and the odor is noticeable. I am surprised that he can feed turnips before milking and not detect the odors. It is absolutely incorrect to feed turnips before milking. May be you can feed them afterwards without harm.

Mr. Cobb:—Was that rape and turnips fed in mangers or barn?

A:—In the barn and also in mangers.

Mr. Glover:—You can feed any way you like, but if fed before milking, the milk will be tainted.

Mr. Cobb:—That is not my experience. I never have been able to put this turnip flavor in milk in any of my experience, and I have been very particular about it. No flavor, not in the butter, nor in the milk, nor in the cream.

A member:—I am inclined to side with Mr. Glover. We have had turnip experience with fellows putting up sauerkraut and we can tell when the cows have been fed with what was left. I am inclined to side with Mr. Glover.

Mr. Newman:—What do you mean by turnips?

Mr. Cobb:—Mine was with the strongest family, the flat purple top turnip.

Mr. Newman:—It is not usual to use that kind of turnip. They feed mangles.

Mr. Cobb:—The turnip of the country is a little bigger.

A member:—I have had considerable experience in feeding turnips or sweet turnips. My father was a dairyman in the old country and we used to make them as a food. It was a rule when turnips were ready to pull that not a turnip was fed to a cow before milking and always fed in manger. Never by any chance got the slightest flavor in our milk. We knew when a cow got into the turnip field and we knew what the result would be. We could hardly eat the butter on account of the turnip flavor.

Q:—Then the difficulty alone was when the cows got this feed before milking?

A:—We got rid of the flavor if fed after milking, in limited quantities that would be of course.

Mr. Cobb:—I would like to ask Mr. Dorsey if he practices milking his cows with what we call the dry hand system?

A:—Why, yes we do as far as possible. I hear Mr. Cobb uses vaseline. I would like to hear what you have got to say about that?

Mr. Cobb:—We have heard a great deal about dry milking. I have in mind—and the dairy press always contend that it was a physical impossibility to go into a herd of cows and milk all of the individuals with dry hands. I went into a herd and the man was a stickler for being particular and he said that they milked with dry hands and he thought my idea was wrong, and he did practice milking with dry hands. I went into the barn while they were milking and the gentleman himself was milking, and I stood by him. He wiped his hands on his overalls leg and there was a nice greese patch. I went into the creamery and the men were sterilizing his milk bottles. They run their fingers in and immersed them in 210 to 220 degrees water, and that was sterilizing his milk bottles. I say it is an impossibility to have all

cows milked with dry teats. I found, a good many years ago, by taking a small amount of vaseline, as large as a bean, according to the size of the cow's teats. Use a damp cloth and anoint all the teats and rub them a little, and the cow can be milked with the greatest ease, and while milking her in this manner you are eradicating any warts or chaps, and you will be surprised if you take a little vaseline at the ease with which this cow will be milked. The milk will keep just as long as under any other system. To illustrate. We furnish cream in a retail way in Monmouth and I guarantee this cream to keep the hottest weather. I have a wagon and peddle it. If it did not keep they did not have to pay for it. I have shipped milk 180 miles and had no ice at all. My customers depended on that cream for a half week.

Q:—Do you have any difficulty in the vaseline collecting dirt?

A:—No sir it puts the cows teats in such a condition that they are perfectly smooth and not the least bit rough and they keep very clean indeed. We have the stables clean and all that of course, and we have had no trouble at all.

By the President:—Cleanliness is next to Godliness, and cleanliness is a thing we have got to look out for.

The next on the program is "Testing Dairy Herds in Illinois," by Mr. A. J. Glover.

Mr. Glover came to us two years ago from Minnesota, and he has been in Northern Illinois for nearly two years and he can give us very valuable information from among the dairymen in the Elgin district. Allow me to introduce Mr. Glover.

RECORDS OF INDIVIDUAL COWS ON DAIRY FARMS.

By Mr. A. J. Glover, Elgin, Ill.

Mr. President, Ladies and Gentlemen.

I have been introduced to you by Mr. Newman and he has told you in brief the work I am doing in the state.

Since the completion of results as published in Bulletin No. 85, ten herds containing 189 cows have completed a year's work. The ten dairies had 247 cows at the beginning of the test, but 33 were sold before the end of the year and 25 did not complete their year's work; some were used for nurse cows and in other cases the farmers failed to weigh and sample their milk.

This report gives the profit and loss of but two of the ten herds that were tested, for only two of the herds had an account kept of the grain and roughage they consumed.

The most profitable cow in these two herds gave a net profit of \$69.58, and the poorest cow was kept at an actual loss of 13 cents. The average net profit of these two herds was \$30.03 a cow.

Pet, the most profitable cow in herd "N," charged 6.5 cents to make one pound of butter-fat, and 33.1 cents to make 100 pounds of milk. Mamie, the cow that gave the least profit in herd "N," charged 22.0 cents to produce one pound of butter-fat, and \$1.05 to produce 100 pounds of milk.

Cow No. 8, the most profitable cow in herd "R," charged 10.2 cents to produce one pound of butter fat and 38.1 cents to produce 100 pounds of milk. Cow No. 3, kept at a loss in herd "R," charged 20.2 cents to make one pound of butter-fat, and 69.9 cents to make 100 pounds of milk.

The average net profit of herd "N," was \$38.77, and the herd charged 9.2 cents to make one pound of butter-fat and 43.0 cents to make 100 pounds of milk.

The average net profit of herd "R" was \$23.19, and the herd charged 13.5 cents to make one pound of butter-fat and 44.3 cents to make 100 pounds of milk.

In estimating the profit or loss on a cow it was counted that the calf paid for her keep while dry, and the skim milk paid for labor. She was charged for the feed consumed when she was giving milk and credited with the amount of butter-fat she produced, which was valued at market price, at the time she made it.

The rations for the cows were not weighed each day. A number of dishes of meal were weighed in order to get the average amount of feed that the measure held and the number of dishes that each cow received a day was recorded. Cut corn stover, hay and ensilage were estimated in the same manner.

The cow that produced the most butter fat gave 8,230 pounds of milk and made 483 pounds of butter. The poorest cow yielded 1,866 pounds of milk, and 90 pounds of butter. The average production for all the herds was 5,025 pounds of milk, 3.98 per cent fat, 200 pounds of butter fat, and 233 pounds of butter.

The average price of grain and roughage from February 1, 1902, to July 1, 1903, was as follows:

Bran	\$15.00	per ton.	Corn and cob meal..	\$12.00	per ton.
Shorts	15.00	" "	Timothy hay	7.00	" "
Corn meal	14.00	" "	Millet hay	7.00	" "
Oil meal	24.00	" "	Clover hay	7.00	" "
Gluten meal	24.00	" "	Millet hay	7.00	" "
Gluten feed	22.00	" "	Corn stover	2.00	" "
Peoria gluten	20.00	" "	Corn silage	2.00	" "
Grano-gluten	20.00	" "	Oats	22.00	" "
			Pasture	1.00	per mo.

The price of grain is based upon the purchase price in the city market, and the price of roughage is based upon the purchase price at the farm. When the cow is charged with the above prices for farm products the farmer receives a profit on his land and the profit which the cows gives him is over and above what he could have received for his products if he had sold them upon the market, and moreover, the cows are often fed that which is not marketable. Take corn stover for example, what would it be

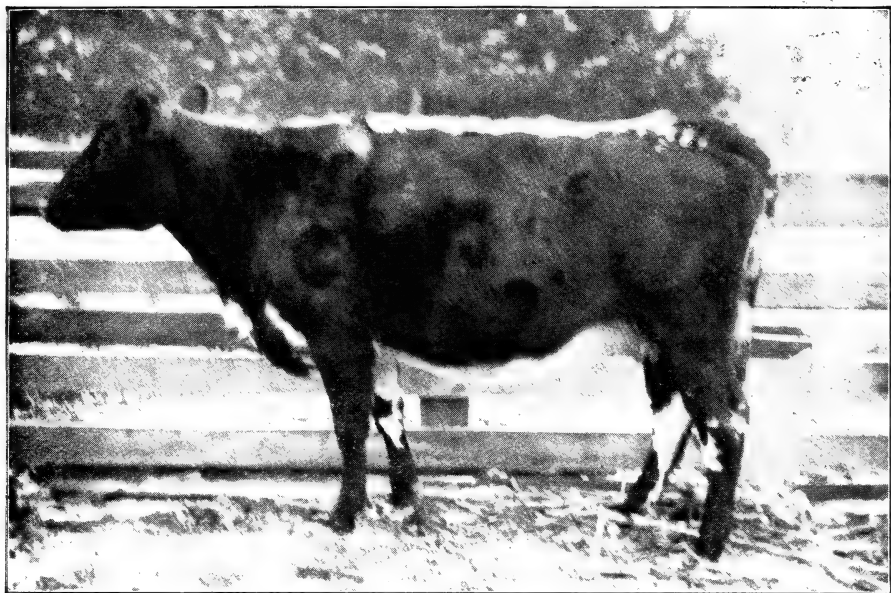
worth if it was not for the live stock kept upon the farms? Another thing to be considered is: the farmer in selling butter fat from his farm, sells but little fertility. The fertility in 500 pounds of butter fat amounts to 15 cents, if it were to be purchased upon the market.

The average prices of butter fat when sold to the creameries for the different months were as follows:

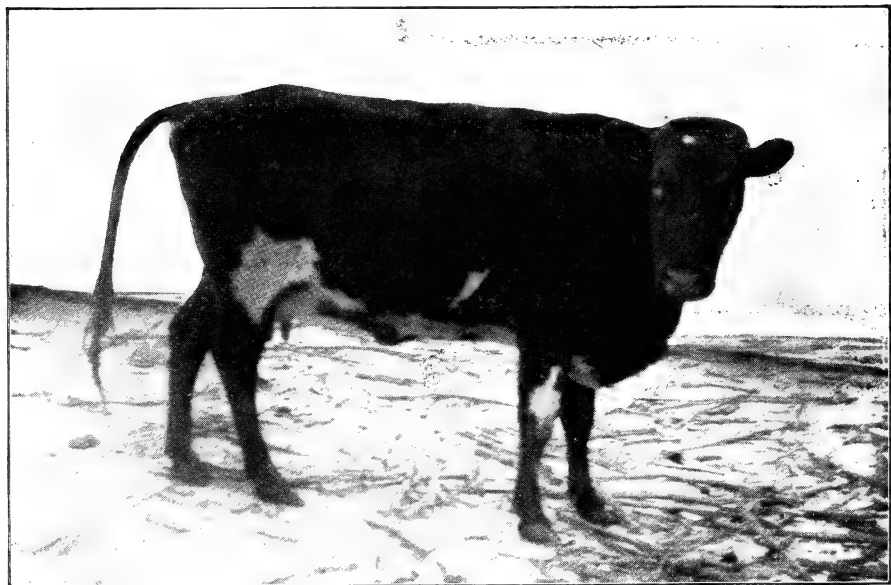
February, 1902	28c	October, 1902	23c
March, 1902	28c	November, 1902	26c
April, 1902	26c	December, 1902	30c
May, 1902	22c	January, 1903	26.5c
June, 1902	21c	February, 1903	25.5c
July, 1902	20.5c	March, 1903	28c
August, 1902	19c	April, 1903	24c
September, 1902	20.5c	May, 1903	20c
		June, 1903	20c

REPORT OF HERD "I."

Herd "I" was composed of natives, grade Shorthorn and one Holstein. The average weight of each cow was 1100 pounds. While this herd produced a little more milk and butter-fat than the average herd yet they could not be classed as special dairy cows. They would be called by most stockmen, dual purpose cattle. The health of the herd on the whole was good, only one cow showing any signs of disorder. Cow No. 1, which promised to be one of the best cows, was taken sick in July and nearly went dry before she was well again. Her record for the year on account of this does not indicate what she is capable of doing under normal conditions. Most of the cows calved in March and went dry in the early part of the winter. During the winter months the fresh cows received a ration of about 4 pounds of ground oats, 4 pounds of ground barley, and all the shredded corn stover, timothy and clover hay they would eat. The owner did not try to make much milk in the winter. The care and the feeding of this herd was much the same as in practiced by most farmers who have not yet learned that care is a most important factor in profitable milk production. The herd was exposed to



CUT NO. 1—Cow No. 3. Herd "I". gave in One Year, 2,914 lb. Milk; average test 4.02%; and 137 lb. Butter.



CUT. No. 2—Cow No. 2. Herd "I", gave in One Year, 6,919 lb. Milk; average test 3.88%; and 313 lb. Butter.

many cold winds in order to gather the corn stover from the fields after the corn was husked. It is strange how few men realize that the cow exerts more energy in gathering such food on cold days than it is worth to her. In nearly every instance where cows have been exposed to cold weather to gather a part of their rations from husked corn fields they have been either small producers of milk and butter-fat, or unprofitable animals. While on the other hand, the cows that are well cared for and comfortably stabled have in most cases returned a profit to their owners.

Yearly Record of Best and Poorest Cow in Herd "I" and Average for Entire Herd.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, No. 2	6919	3.88	268	313
Poorest cow, No. 3	2914	4.02	117	137
Average yield of entire herd.....	5174	3.92	203	237

Table 1.—Record of Each Cow in Herd "I" for One Year.

No. of Cow.	Age, yr.	Breed	Date of Calving.	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.	Days in Milk.
3	2	Grade Shorthorn.	3-25-02	2914	4.02	117	137	287
4	9	Native	3-25-02	3844	4.50	173	202	203
1	11	Native	4-28-02	4669	3.84	179	209	266
7	2	Holstein	2-15-02	6200	3.45	214	250	308
6	6	Grade Shorthorn.	3-10-02	5920	3.94	233	272	301
5	10	Native	3-10-02	5749	4.09	235	274	308
2	8	Grade Shorthorn.	3- 1-02	6919	3.88	268	313	365

REPORT OF HERD "J."

Herd "J" was composed of natives, grade Jerseys, and one grade Holstein. The average weight was 1050 pounds. While the herd was composed of cows that were by no means highly developed, yet, they would be classed as dairy stock. The herd was put in a comfortable barn at night, but allowed to run in the husked corn fields during the day even though the weather was cold and severe. The health of the herd was good but it showed the effects of being exposed to the cold weather. Most of the

cows dropped their calves in the spring and early summer, only one cow calving in the autumn. In the months of February, March and April, to the cows that were giving the most milk, the following ration was given: 4 pounds of bran, 4 pounds of corn and cob meal, and shredded corn stover. This ration would have been much better if alfalfa hay could have been added. It should be remembered, however, that the cows were giving a small yield of milk and perhaps the ration under the circumstances contained enough nutrients for them.

During the months of December and January the cows received the following:

RATION.

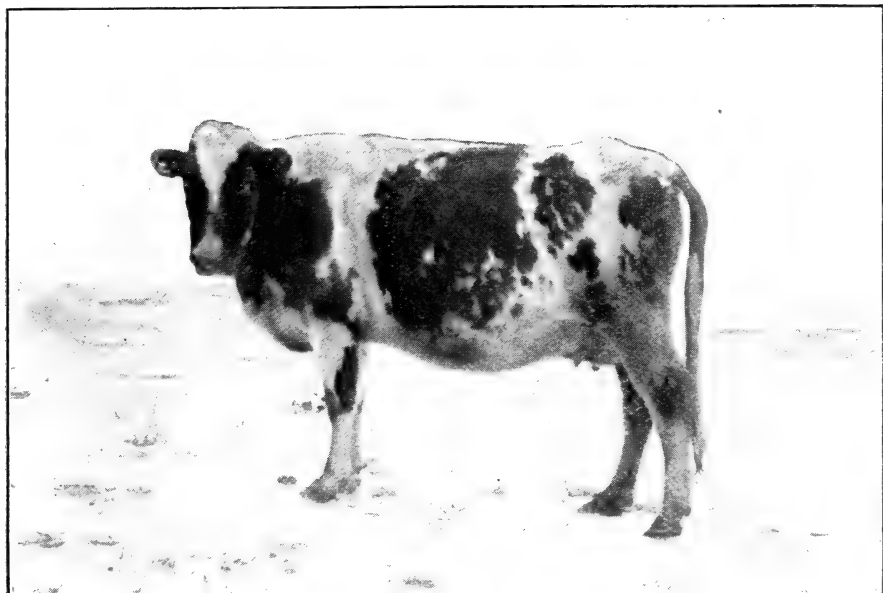
Food Stuff.	Lb.	Dry Matter.	Protein.	Carbohy- drates.	Fat.
Corn and cob meal.....	5	4.24	.220	3.600	.145
Rye	3	2.65	.297	2.028	.033
Barley	2	1.78	.174	1.312	.032
Corn stover	20	11.90	.340	6.480	.140
Total nutrients		20.57	1.031	12.820	.350

This is a poor ration for a dairy cow as it contains too little protein and it is not a good combination of concentrates.

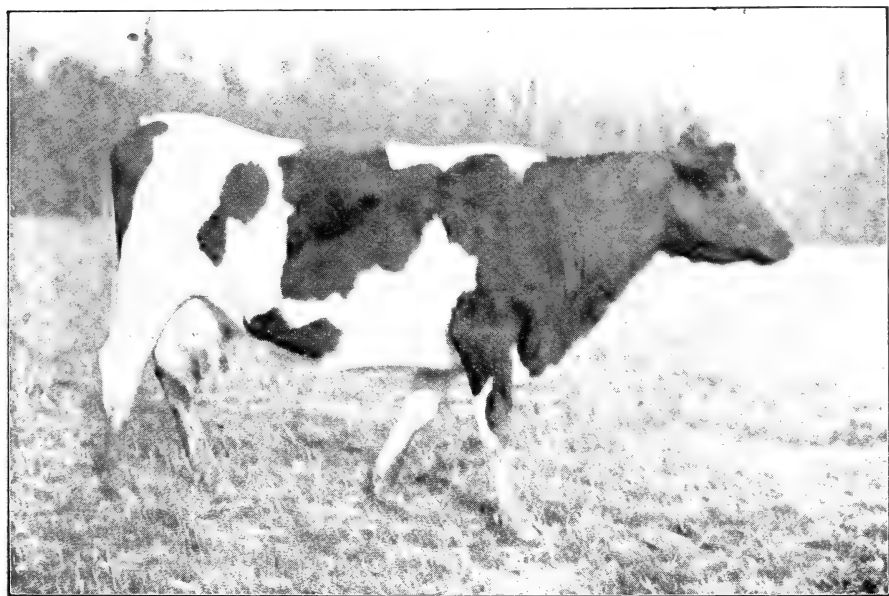
If it seemed unprofitable to exchange home grown grain for mill feed, well cured clover hay cut fine and mixed with the meal would have improved the ration.

Yearly Record of Best and Poorest Cow in Herd "J" and Average for Entire Herd.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, No. 4	7393	3.73	276	322
Poorest cow, No. 2	3875	3.66	142	166
Average yield of entire herd	4779	4.08	195	228



CUT NO. 3—Cow No. 4, Herd "J". Gave in One Year, 7,393 lb. Milk; average test 3.73%; and 322 lb. Butter.



CUT 4—Cow No. 2, Herd "J", gave in One Year, 3,815 lb. Milk, average test 3.66%; and 166 lb. Butter.

Table 2.—Record of Each Cow in Herd "J" for One Year.

No. of Cow.	Age, yr.	Breed	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.	Days in Milk.
2	6	Grade Holstein...	6-19-02	3875	3.66	142	166	273
7	8	Native	4-28-02	3778	3.89	147	172	251
8	2	Grade Jersey	5- 4-02	3590	4.82	173	202	308
5	5	Grade Jersey	4-13-02	3698	5.46	202	236	315
6	13	Native	4-19-02	6269	3.38	212	247	308
1	3	Native	8-20-02	4848	4.41	214	250	365
4	7	Native	3-25-02	7393	3.73	276	322	343

REPORT OF HERD "K."

Herd "K" was composed entirely of native stock which had been selected for their milk giving proclivities. The cows were dairy type, although none of them could be traced to full blood dairy stock. The owner had purchased most of them and had exercised considerable skill in his selections. The cows had no adverse periods during the time the test was made, but were fed and cared for quite systematically throughout the year. It might be said, however, that there were times in the winter when the dairy would have done fully as well with less corn and a little more bran or oil meal added to their rations, especially during the months when nothing else was being fed except ear corn and corn stover. The herd was largely a winter dairy and it was stabled in a warm and well-kept barn.

The work of testing the herd began February 13, 1902, and the cows giving a good flow of milk received the following ration until they were turned out to pasture: 8 pounds of corn and cob meal, 4 pounds of bran, millet hay once a day and corn stover. It would have been better and more economical to have fed less corn and more bran. It may be said, however, that the cows did very well on this ration.

During the months of October and November the herd received a liberal allowance of soft ear corn while on a fairly good pasture. From December 1 to the completion of the test each cow received a ration of one-half bushel of soft ear corn together with corn stover. The cows dropped off very rapidly in milk flow after they were taken from the pasture and fed this ration. For ex-

ample, cow No. 4 calved September 20, and for the week ending November 13 she was giving 192 pounds of milk and 7.86 pounds of butter-fat; for week ending January 1 she was giving only 63 pounds of milk and 2.66 pounds of butter-fat.

Cow No. 5 calved October 3, and for week ending November 13 she gave 183 pounds of milk and 5.86 pounds of butter-fat; for week ending January 1 she had shrunk to 78 pounds of milk and 2.96 pounds of butter-fat.

This is another striking example that dairy cows should be fed something besides corn if maximum yields are expected. It is the evenly sustained yield and not the spasmodic feeding spurts that gives the largest returns.

Yearly Record of Best and Poorest Cow in Herd "K," and Average for Entire Herd.

	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Best cow, No. 7	6623	4.61	305	356
Poorest cow, No. 1	3923	3.54	139	162
Average yield of entire herd	5711	3.99	228	266

Table 3.—Record of Each Cow in Herd "K" for One Year.

Group 1.—Cows Producing Less Than 230 Pounds of Butter Fat.

No. of Cow.	Age, yr.	Breed	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.	Days in Milk.
1	6	Native	8-23-02	3923	3.54	139	162	203
6	5	Native	2-11-02	5734	3.77	216	252	290
9	9	Native	5- 5-02	4914	4.50	221	258	196
8	3	Native	4-23-02	5747	3.98	229	267	273
4	6	Native	9-20-02	5316	4.31	229	267	273

Group 2.—Cows Producing Less Than 305 Pounds of Butter Fat.

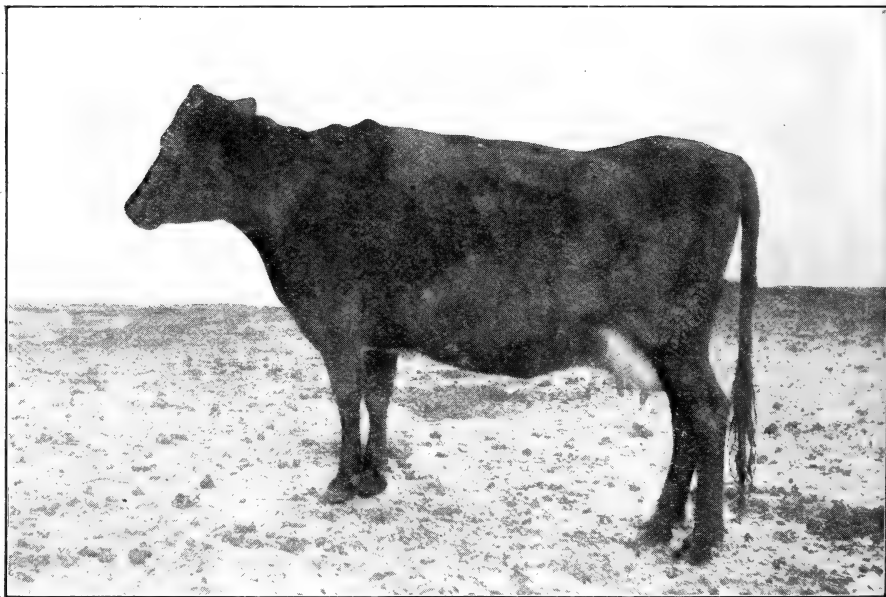
5	8	Native	10- 3-02	5966	3.91	233	272	343
3	7	Native	12-26-02	6103	3.90	238	278	294
2	6	Native	10-15-02	7074	3.42	242	282	294
7	3	Native	4-20-02	6623	4.61	305	356	343

REPORT OF HERD "L."

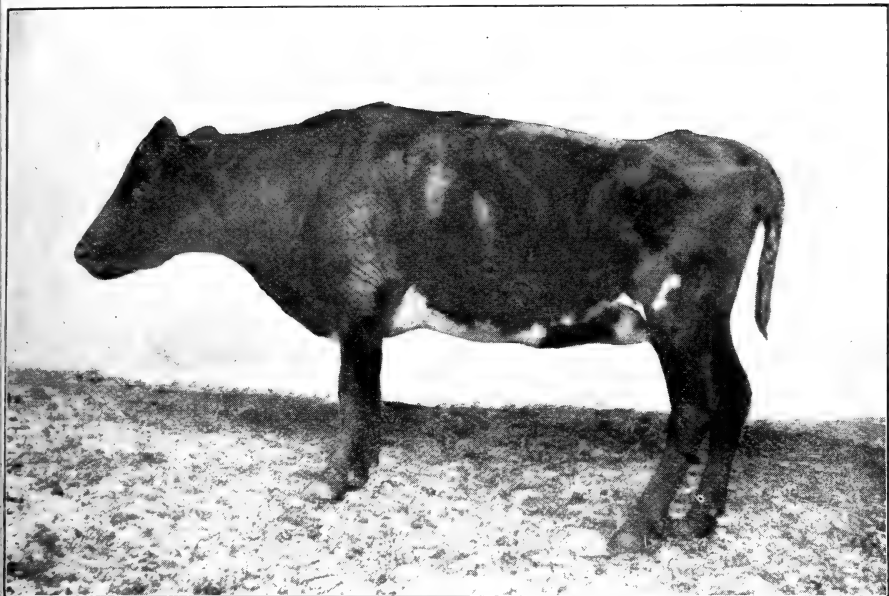
Herd "L" was composed largely of grade Shorthorns. There were a few grade Jerseys, grade Holsteins and natives. The average weight of each cow was 1000 pounds. It was the

object of the owner to keep a dual purpose herd. All the cows were bred to a full blood Shorthorn bull and all the calves were kept either to feed for beef or to be raised for milch cows. The calves were allowed to suck their dams several weeks after they were dropped. While this practice probably accounts to some extent for the low average yield of the herd, yet, there are other causes why the cows did no better. The barn in which the herd was kept at night was not warm enough for dairy cows, and moreover, even though the day was cold the cows were turned into the husked corn fields.

The work of testing this herd began on January 16, 1902, and from this time until the cows were turned out to pasture they received the following ration: 2 pounds of bran, 2 pounds of corn meal or 2 pounds of ear corn and mammoth clover hay, which was



CUT 7—Cow No. 17, Herd "L", gave in one year, 5,318 lb. Milk, average test 4:23%; and 263 lb. Butter.



CUT 5—Cow No. 5, Herd "L", gave in One Year 3,136 lb. Milk; average test .64%; and 133 lb. Butter.



CUT 6—Cow No. 3, Herd "L", gave in One Year 5,958 lb. Milk; average test .86%; and 268 lb. Butter.

somewhat woody so that considerable of it was not eaten by the cows.

The cows were turned out to pasture May 15, and as soon as grass was plentiful they received no grain. During the months of December and January the herd received a ration of 40 pounds of corn silage together with all the mammoth clover hay they would eat.

It is very plain to the skillful feeder that neither of these rations given in the winter was sufficient for a herd of cows giving large flows of milk. Intelligent breeding and judicious selection count for naught when such methods of feeding are practiced

Yearly Record of the Best and Poorest Cow in Herd "L," and Average of Entire Herd.

	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Best cow, No. 3	5958	3.86	230	268
Poorest cow, No. 13	2658	3.65	97	113
Average yield of entire herd	3891	4.04	157	183

Table 4.—Record of Each Cow in Herd "L" for One Year.

Group 1.—Cows Yielding Less Than 150 Pounds of Butter Fat.

No. of Cow.	Age, yr.	Breed	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.	Days in Milk.
13	12	Native	4-15-02	2658	3.65	97	113	259
14	11	Grade Holstein ..	11-15-02	2644	4.01	106	124	217
5	12	Native	10-24-02	3136	3.61	114	133	259
6	5	Grade Shorthorn..	3-31-02	3444	4.01	138	161	280
28	4	Grade Shorthorn..	1-15-02	3519	4.09	144	168	294
11	3	Grade Shorthorn..	2- 1-02	3920	3.72	146	170	308

Group 2.—Cows Yielding Less Than 170 Pounds of Butter Fat.

19	2	Grade Holstein...	7- 5-02	4097	3.69	151	176	263
18	3	Grade Shorthorn..	9-14-02	3663	4.15	152	177	330
22		Grade Shorthorn..	12-20-01	3477	4.43	154	180	245
15	11	Grade Shorthorn..	2- 1-02	3814	4.09	156	182	308
29	5	Grade Shorthorn..	1- 1-02	4516	3.48	157	183	308
9	2	Shorthorn	7- 9-02	3969	3.96	157	183	308
21	2	Grade Jersey	3-25-02	3894	4.16	162	189	245

Group 3.—Cows Yielding Less Than 231 Pounds of Butter Fat.

7	5	Grade Jersey	4-14-02	3889	4.47	174	203	266
4	6	Native	4- 7-02	4227	4.26	180	210	263
1	3	Grade Jersey	7-31-02	3888	4.70	183	214	329
17	6	Grade Jersey	3-20-02	5318	4.23	225	263	301
3	6	Grade Shorthorn..	3- 1-02	5958	3.86	230	268	329

REPORT OF HERD "M."

This was a herd consisting of twenty-three full blood Jerseys. They were rather small in size, each cow weighing about 850 pounds. The cows were kept in a clean barn, but one that was scarcely warm enough for dairy cows. The cows' udders were washed or brushed before each milking which shows that the owner took much pains in producing clean and wholesome milk. While this herd was composed of full blood Jerseys, yet, the average yearly record is rather low.

Three things seem to be responsible for their low records.

First The lack of judicious selection. This is a common fault among many of the breeders of full blood stock. It seems to be hard for them to realize that many of their full bloods are not profitable animals.

Second: The cows were not fed enough grain to produce large yields. There was no time during the test that they were given over five pounds of ground food a day. The owner reported that the cows were receiving 10 pounds of meal a day, but by actual weight they were receiving only 5 pounds.

Third: In cold weather the barn was cold and the cows were turned out in the yard too long on such days. The herds which have been kept in warm barns and exposed but little, if any, to the cold, have given the largest returns and have showed as good health as those that were turned out every day during the winter.

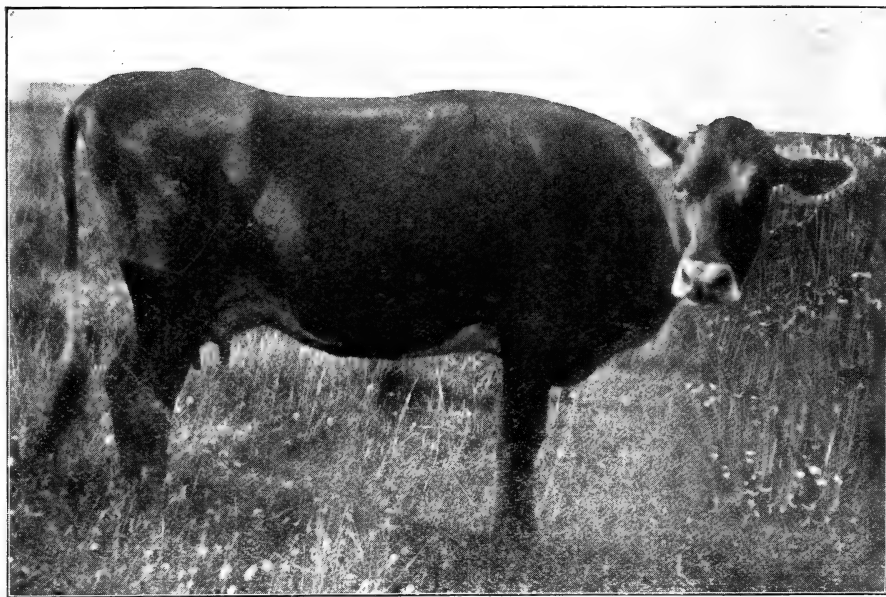
The work of testing the herd began January 23, and during the months of February, March and April they received the following:

RATION.

Food Stuff.	Lb.	Dry Matter.	Protein.	Carbohy- drates.	Fat.
Bran	2.5	2.21	.322	1.002	.085
Shorts	2.5	2.20	.305	1.25	.095
Corn stover	15.0	8.92	.255	4.86	.105
Total nutrients		13.33	.882	7.112	.285
Oat straw ad libitum.					

In April timothy and clover hay were substituted for corn stover. The herd was turned out to pasture May 20 and received 2.5 pounds of shorts a day during the summer. After November 15 and during the months of December, January and February the cows received 5 pounds of bran, eight pounds of timothy and clover hay, and shock corn.

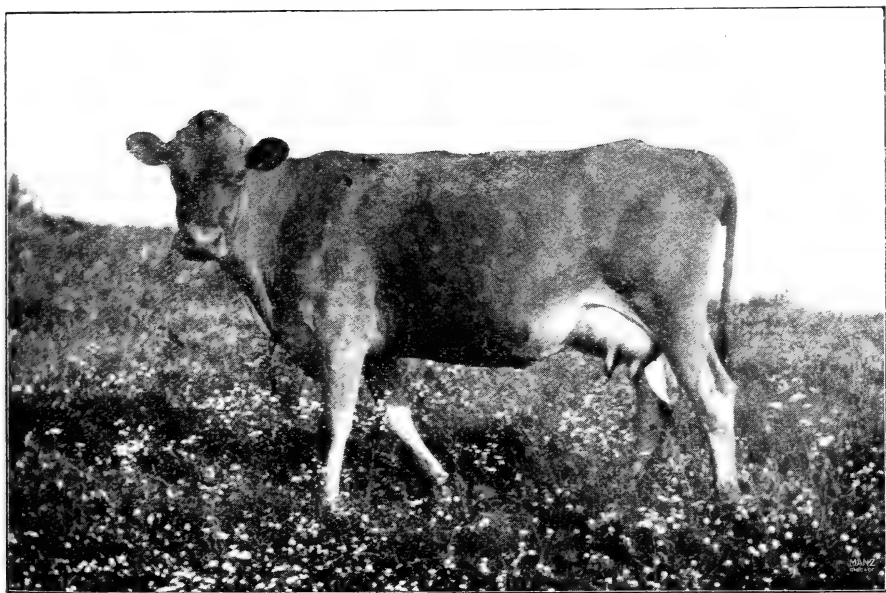
This is the best ration that the herd received during the winter, notwithstanding the fact that feeding corn in the ear to dairy cows is considered a very poor way to feed grain. The concentrates of the dairy herd's ration should be prepared by grinding the grain very fine.



CUT 10—Peach. Herd "M", gave in One Year 2,832 lb. Milk, average test 4.77%; and 153 lb. Butter.



CUT 8—Pet. Herd "M", gave in One Year 4,956 lb. Milk; average test 4.52% ;
and 231 lb. Butter.



CUT 9—Tabo. Herd "M", gave in One Year, 6 146 lb. Milk; average test 4.10% ;
and 294 lb. Butter.

Yearly Record of Best and Poorest Cow in Herd "M," and Average for Entire Herd.

	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Best Cow, "Tabo"	6146	4.10	252	294
Poorest Cow, "Shorty"	2677	4.86	130	152
Average yield of entire herd	4052	4.76	194	226

Table 5.—Record of Each Cow in Herd "M" for One Year.

Group 1.—Cows Producing Less Than 175 Pounds of Butter Fat.

Name of Cow.	Age, yr.	Breed.	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.	Days in Milk.
Peach	5	Jersey.	.....	2832	4.77	135	158	245
Shorty	1½	Jersey.	3-15-02	2677	4.86	130	152	315
Flint	7	Jersey.	1- 1-02	2871	5.09	146	170	245
Jolly	2	Jersey	3-29-02	3329	5.20	173	202	315
Hold up	8	Jersey	1- 1-02	3635	4.79	174	203	245
			11-12-02					

Group 2.—Cows Producing Less Than 190 Pounds of Butter Fat.

David Doty...	5	Jersey.	3-25-02	3580	4.97	178	208	301
Big Bob	8	Jersey.	1-17-02	3825	4.76	182	212	245
Brownny	10	Jersey.	12- 1-02	4360	4.17	182	212	294
Cherry	5	Jersey.	11- 1-02	4222	4.33	183	214	273
Little Bob ...	4	Jersey.	10-15-01	4016	4.63	186	217	294
Boss	5	Jersey.	12- 1-02	4031	4.66	188	219..	315
Lucky	3	Jersey.	6-17-02	3469	5.42	188	219	365

Group 3.—Cows Producing Less Than 220 Pounds of Butter Fat.

Pride	5	Jersey.	1-27-02	3693	5.20	192	224	294
Polly	6	Jersey.	.....	3822	5.13	196	229	315
Mollie	6	Jersey.	9- 1-01	3853	5.19	200	233	365
Black Bob ...	5	Jersey.	11- 2-02	4348	4.83	210	245	273
Sis	2	Jersey.	3-20-02	4306	4.88	210	245	258
Plum	5	Jersey.	2-20-02	4576	4.81	220	257	289

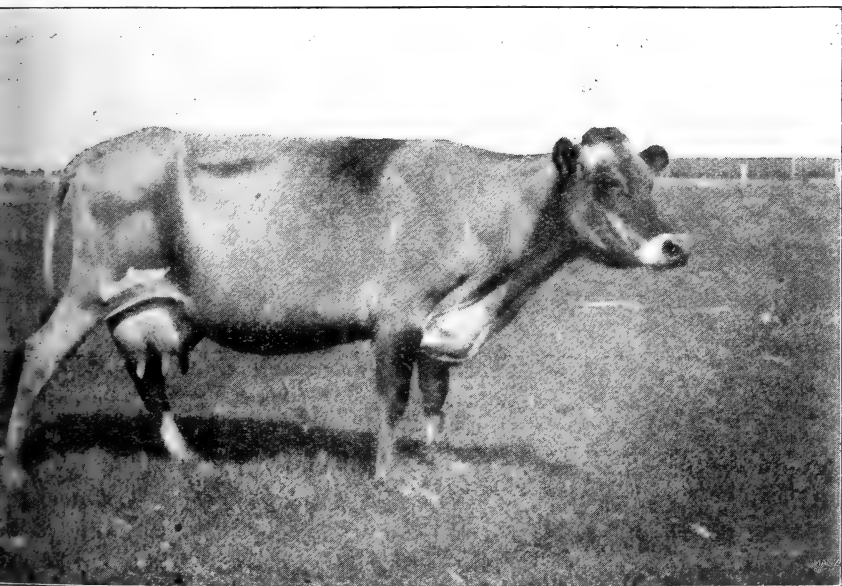
Group 4.—Cows Producing Less Than 255 Pounds of Butter Fat.

Clover	5	Jersey.	10-15-01	4972	4.44	221	258	315
Nig	6	Jersey.	9- 1-02	4878	4.59	224	261	365
Pet	6	Jersey.	1- 1-02	4956	4.52	224	261	315
Bill Bob	10	Jersey.	1- 1-02	4813	4.97	239	279	294
Tabo	5	Jersey.	1-15-02	6146	4.10	252	294	315

REPORT OF HERD "N."

This herd contained mostly Jerseys and high grade Jerseys, there were a few grade Holsteins, and a few natives. The

average weight of the cows was about 900 pounds and the most of them were in good health during the year. This is one of the best herds that has been tested by the Experiment Station. The dairy not only gave the largest net profit of all the herds tested, but it produced milk and butter fat the cheapest. Undoubtedly the herd would have done better if some of the best cows had not aborted. There was a number of abortions in the dairy during the year and it caused the owner considerable trouble to stop this dreadful disease. The cows were kept in a clean, warm and well ventilated barn, and the most of the time they were well cared for. In April and to May 15, the herd was fed a ration of 4.5 pounds of grano-gluten, 6 pounds of clover hay, and shredded corn stover. From May 15 to October 15, the cows received nothing but pasture grass. From October 15 to December 1,



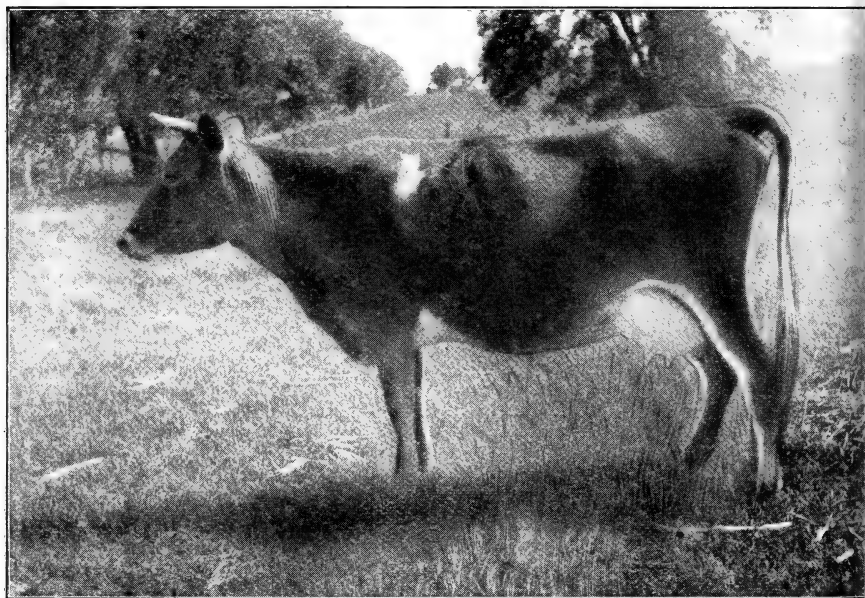
CUT 11—Pet, Herd "N", gave in One Year, 8,230 lb. Milk; average test 3%; 483 lb. Butter; net profit \$69.58. She charged 33.1 cents to make 100 lb. milk, and 6.5 cents to make one pound of butter fat.

the cows received a ration of shock corn and pasture grass, the pasturage being good until late in November. During the months of December, January, February and March the herd received the following:

RATION.

Food Stuff.	Lb.	Dry Matter.	Protein.	Carbohy- drates.	Fat.
Grano-gluten	8	7.52	2.136	3.104	.992
Clover hay	7	5.93	.476	2.506	.119
Corn silage	30	6.27	.270	3.390	.210
Corn stover	15	8.92	.255	4.860	.105
Total nutrients		28.64	3.137	13.860	1.426

This ration was fed to the best milkers in the herd and not to the strippers or poor cows. This combination of food con-



CUT 12—Gazelle, Herd "N", gave in One Year, 7,030 lb. Milk; average t 4.98%; 408 lb. Butter; net profit \$56.12. She charged 37.4 cents to produce 100 of Milk and 7.5 cents to make one pound of Butter Fat.

tains ample nutrients for cows giving the amount of milk and butter fat that these cows were producing. It might have been better to have fed a few pounds of bran instead of so much granogluten for the ration contains an abundance of protein. There were only a few cows that required that amount of protein.

Yearly Record of Best and Poorest Cow in Herd "N," and Average for Entire Herd.

	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Best cow, Pet	8230	5.03	414	483
Poorest cow, Mamie	1986	4.78	95	111
Average record of entire herd	5642	4.68	264	308

Pet charged 33.1 cents to make 100 pounds of milk, and 6.5 cents to make one pound of butter fat.

Mamie charged 1.05 cents to make 100 pounds of milk, and 22 cents to make one pound of butter fat.

The average cost to produce 100 pounds of milk was 43.0 cents and 9.2 cents to produce one pound of butter fat.

Pet gave the largest profit which was \$69.58 and Mamie the least, which was 84 cents.

The average profit for each cow in the dairy was \$38.77.

In the tables that give the net profit of this herd, it will be noticed that a few cows charged but little for their board. For example: Pink charged only \$9.87 for her keep. This would seem almost impossible unless we note that she dropped her calf in the spring and went dry in the fall, and moreover, we should remember that when a cow is dry she is not charged for any feed or roughage that she consumes. Pink made nearly all her record upon grass pasture and consequently received but little grain. This is in substance true of all the cows that charged less than \$20.00 for their keeping.

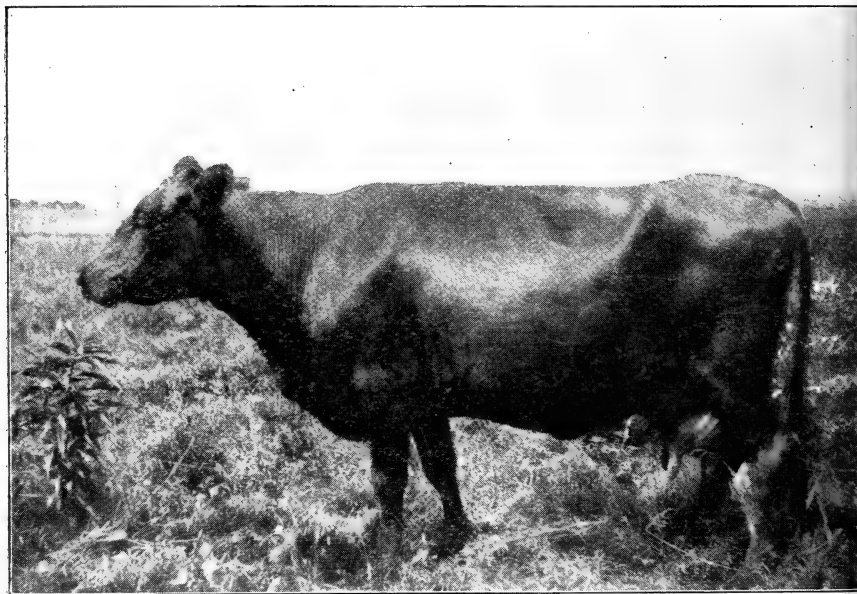
It should be observed that Pet and Gazelle charged but little to produce butter fat. How important this is to the farmer who sells his milk by the test. It would be hard to imagine any conditions under which these cows would not return a good profit for they produce butter fat and milk so economically.

It is impossible to estimate the value of these animals as breeders when compared with the average cow. If their average tests, however, were only 2.50 per cent fat, they would be but ordinary individuals. It is their high per cent of butter fat, together with the large flow of milk that makes them valuable, for breeding purposes, and very profitable cows.

Table 6.—Showing Profit or Loss for Each Cow in Herd "N" for One Year.

Group 1.—Kept at a Very Fair Profit.

Name of Cow.	Milk, lb.	Fat, %.	Fat, lb.	Butter lb.	Gross Returns.	Cost of Feed.	Net Profit.
Mamie	1986	4.78	95	111	\$21.81	\$20.97	\$.84
Dora	3974	4.33	172	201	41.47	24.77	16.70
Minnie	5009	3.51	176	205	41.06	21.62	19.44
Carrie	3523	5.45	192	224	46.69	23.76	22.93
Goldie	3509	5.50	193	225	44.31	20.73	23.58
Poke	4943	4.69	232	271	54.65	28.23	26.42
Knott	4116	4.30	177	207	40.24	13.08	27.16



CUT 13—Minnie, Herd "N", gave in One Year 5,009 lb. Milk; average 3.51%; and 205 lb. Butter.

ILLINOIS DAIRYMEN'S ASSOCIATION.

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Group 2.—Kept at a Good Profit.

Lily S.	5424	4.52	245	286	\$57.38	\$27.18	\$30.20
Pink	4420	4.14	183	214	41.36	9.87	31.49
Trip	4811	4.84	233	272	54.28	21.07	33.21
Star	5935	4.50	267	312	62.68	28.98	33.70
Jennie	4095	5.13	210	245	47.83	13.98	35.85
Curley	6723	3.72	250	292	57.97	23.60	34.37
Grisette ...	4496	5.63	253	295	61.35	26.26	35.09

Group 3.—Kept at a Very Good Profit.

Jet	6640	4.10	272	317	\$67.45	\$26.23	\$41.22
Jean	5473	4.28	289	337	69.11	27.55	41.56
Dolly	4858	5.58	271	316	67.38	25.74	41.64
Cherry	4702	5.68	267	312	62.25	20.20	42.05
Betty	5313	5.67	301	351	74.33	28.66	45.67
Spark	7764	3.76	292	341	71.50	25.24	46.26

Group 4.—Kept at an Excellent Profit.

Blue.....	6980	4.34	303	354	\$74.78	\$26.74	\$48.04
Harvey	7674	4.20	322	376	77.51	28.72	48.79
W. L.	7468	4.30	321	375	75.59	26.76	48.83
Frankie	6378	4.70	300	350	78.08	27.20	50.88
Lily	6181	5.47	338	394	82.84	29.64	53.20
Gazelle	7030	4.98	350	408	82.39	26.27	56.12
White Leg .	7527	4.80	361	421	83.95	25.76	58.19
Harriet	8446	4.59	388	453	91.97	28.72	63.25
Pet	8230	5.03	414	483	96.84	27.26	69.58

Table 7.—Record of Each Cow in Herd "N" for One Year.

Group 1.—Cows Producing Less Than 225 Pounds of Butter Fat.

Name of Cow.	Age, yr.	Breed.	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	ter. in lb.	Days Milk
Mamie	1	Jersey	4-11-02	1986	4.78	95	111	343
Dora	6	Gr. Holstein.....	*12-15-02	3974	4.33	172	201	315
Minnie	7	Gr. Shorthorn....	8-10-01	5009	3.51	176	205	315
Knott	4	Gr. Jersey	*11-12-02	4116	4.30	177	207	266
Pink	4	Holstein & Jersey	3-11-02	4420	4.14	183	214	217
Carrie	6	Gr. Jersey	*2-20-02	3523	5.45	192	224	315
Goldie	6	Jersey	2-15-02	3509	5.50	193	225	308
Jennie	3	Gr. Jer. & S. H...	2- 8-02	4093	5.13	210	245	275

*Aborted.

Group 2.—Cows Producing Less Than 275 Pounds of Butter Fat.

Name of Cow.	Age, yr.	Breed	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	But-ter, lb.	Days in Milk
Poke	3	Jersey	*7- 3-02	4943	4.69	232	271	365
Trip	5	Jersey & Holt....	*2- 5-02	4811	4.84	233	272	322
Lily S.	6	Gr. Holstein	3-14-02	5424	4.52	245	286	345
Curly	6	Gr. Holstein	5-14-02	6723	3.72	250	292	301
Grisette	5	Gr. Jersey	2- 2-02	4496	5.63	253	295	329
Cherry	3	Gr. Jersey	2-10-02	4702	5.68	267	312	322
Star	3	Gr. Holstein	5-31-02	5935	4.50	267	312	329
Dolly	4	Gr. Jersey	9-30-02	4858	5.58	271	316	322
Jet	7	Jersey & Holst...	10-11-02	6640	4.10	272	317	294

*Aborted.

Group 3.—Cows Producing Less Than 350 Pounds of Butter Fat.

Jean	5	Gr. Jer. & S. H...	12- 2-02	5473	5.28	289	337	350
Spark	7	Jer. & Holst....	12-14-02	7764	3.76	292	341	315
Frankie	8	Jer. & S. H.	9-30-02	6378	4.70	300	350	315
Betty	4	Gr. Jersey	10-25-02	5313	5.67	301	351	350
Blue	6	Gr. Holstein	12- 7-02	6980	4.34	303	354	345
W. L.	6	Native	3-15-02	7468	4.30	321	375	365
Harvey	5	Gr. Shorthorn ...	9-10-02	7674	4.20	322	376	315

Group 4.—Cows Producing Less Than 415 Pounds of Butter Fat.

White Leg ...	8	Gr. Jer. & Holst..	3- 9-02	7527	4.80	361	421	365
Lily	7	Gr. Jersey	12-24-02	6181	5.47	338	394	365
Gazelle	3	Gr. Jersey	3-15-02	7030	4.98	350	408	365
Harriet	7	Gr. Jersey	*11-10-02	8446	4.59	388	543	365
Pet	6	Jersey	3- 2-02	8230	5.03	414	483	350

*Aborted.

REPORT OF HERD "O."

This dairy contained grade Shorthorns, grade Holsteins, grade Jerseys and natives. The average weight of the cows was about 1050 pounds and their health, on the whole, was good. A few cows, however, showed the effects of poor care and poor feeding. A new tenant took charge of this farm March 1 and the testing of the cows began May 1. A number of the cows had freshened during the winter and no records being kept of their dates of calving it is impossible to give the time when a number of the cows freshened. The average low record of this dairy is probably due to the lack of judicious feeding. Of course,

care and the class of cows had their bearing upon the yield of the herd. The external appearances of the cows indicated that they were capable of producing larger yields than the records show. The tenant did not realize the importance of giving the herd a liberal allowance of grain, but tried to make milk economically by feeding only a little grain.

The cows were kept in a comfortable barn during the winter and were fairly well cared for. During the summer months the dairy received no grain, blue grass pasture being the only ration that was given. It was October before the cows received any green corn with the grass pasture. From December to the completion of the test the herd received a ration of about 40 pounds of corn ensilage, 5 pounds of bran, corn stover and a little timothy hay. There was some alfalfa hay raised on the place, but this was covered up with timothy hay. The tenant did not realize the alfalfa was worth three times as much for feeding as timothy hay.

There were thirty shoats that ran behind forty-five cows and received no other grain besides the droppings from the cows, and they grew very well. While the practice of allowing hogs to run in the barn twice a day to gather the droppings from the dairy cannot be recommended from a sanitary standpoint, yet this instance indicates that considerable feed goes to waste even though our corn is fed in the form of silage.

Yearly Record of Best and Poorest Cow in Herd "O," and Average for Entire Herd.

	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Best cow, Cherry	6606	3.84	254	296
Poorest cow, Speck	2496	4.09	102	119
Average record of entire herd	4233	3.35	163	190

Table 8.—Record of Each Cow in Herd "O" for One Year.
Group 1.—Cows Producing Less Than 125 Pounds of Butter Fat.

							But- Days	
Name of Cow.	Age, yr.	Breed.	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	ter. lb.	in Milk
Speck	3	Native .....	.....	2496	4.09	102	119	195
Gertie	5	Native	6- 1-02	3158	3.39	107	125	196
Spot	13	Native	10-28-02	3369	3.27	110	128	260
White Tail...	7	Gr. Holstein	7-10-02	4178	2.90	121	141	245
Olive	3	Native	7-14-02	3389	3.63	123	144	259
Hardy	15	Native .....	.....	3349	3.70	124	145	245
Tessie	3	Native .....	.....	3036	4.08	124	145	196

Group 2.—Cows Producing Less Than 150 Pounds of Butter Fat.

White Face...	6	Gr. Holstein	7- 1-02	3415	3.66	125	146	260
Jennie	6	Native	6- 6-02	3947	3.24	128	149	189
Scottie	8	Native	7-15-02	3438	3.84	132	154	210
Grace	3	Native	6-15 02	3263	4.08	133	155	259
Jet	8	Native .....	.....	3435	3.90	134	156	231
Gray	8	Native	6- 1-02	3547	4.09	145	169	294
Durham	8	Gr. Shorthorn ...	3- 1-02	3686	4.04	149	174	196

Group 3.—Cows Producing Less Than 175 Pounds of Butter Fat.

Jersey	3	Gr. Jersey .....	.....	2429	6.22	151	176	245
Reddy	8	Native .....	.....	3922	4.00	157	183	245
Daisy	4	Native	9- 1-02	3612	4.37	158	184	308
Brindle	8	Native	7- 7-02	4185	3.78	158	184	210
Knocked Ear..	8	Native	7- 7-02	4296	3.75	161	188	260
Nellie	4	Native .....	.....	4328	3.88	168	196	350
Blue	6	Native .....	.....	4131	4.12	170	198	259

Group 4.—Cows Producing Less Than 200 Pounds of Butter Fat.

Kit	11	Native .....	.....	4290	4.08	175	204	308
White Jaw ..	7	Gr. Holstein ....	.....	4528	4.00	181	211	256
Roaney	8	Native	7- 8-02	4458	4.08	182	212	196
Gip	9	Native	3- 1-02	5014	3.67	184	215	259
Edith	7	Native	8-25-02	5191	3.76	195	228	308
Mouse	12	Native .....	.....	5403	3.63	196	229	294

Group 5.—Cows Producing Less Than 255 Pounds of Butter Fat.

Edna	7	Native	11- 1-02	5673	3.53	200	233	294
Kicker	8	Gr. Shorthorn...	9- 1-02	5333	3.96	211	246	350
Alma	4	Native .....	.....	5215	4.08	213	249	358
Walter	9	Native	6- 6-02	5820	3.75	218	254	287
Holstein	6	Gr. Holstein	11- 1-02	5953	3.71	221	258	294
Blacky	5	Native .....	.....	5822	3.90	227	265	351
Cherry	8	Native	3- 1-02	6606	3.84	254	296	308

*Aborted.

REPORT OF HERD "P."

This herd was composed of natives, and one grade Jersey. The owner gave his herd but little attention, for the most of his time was devoted to other things. The average weight of the cows was about 950 pounds and they were in rather poor condition during the year. The owner seemed anxious to know what his cows were doing for him but he was away from home so much attending to other business that his cows did not receive the proper care and were sometimes poorly fed. The records of this herd shows very clearly the class of cows it contained and the kind of care that the dairy received. When a herd of cows gives such a low yearly average there is not much to say about it, except to note what poor cows, poor feeding and poor care will produce. Some of the time the herd was fed and cared for well, but on the whole the dairy was much neglected. There are many dairy herds that are kept much the same as this one and the owners wondered why their cows do not pay. The herd was stabled at nights in the winter, but was seldom kept in during the day even though it was cold. The cows were turned out to pasture grass in the summer and in the winter they were fed some bran, corn and cob meal and dried brewers grains, together with corn stover and timothy hay.

Yearly Record of Best and Poorest Cow in Herd "P" and Average for Entire Herd.

	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Best Cow, Rose	4547	3.85	175	204
Poorest cow, Bob	1866	4.13	77	90
Average record of entire herd	3397	3.86	131	153

Table 9.—Record of Each Cow in Herd "P" for One Year.

Group 1.—Cows Producing Less Than 125 Pounds of Butter Fat.

Name of Cow.	Age, yr.	Breed.	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	But-ter, lb.	Days in Milk
Bob	7	Native	1-15-02	1866	4.13	77	90	250
Butter Cup ...	3	Native	1-19-02	2374	3.88	92	107	245
Bessie	3	Native	2-10-02	2399	3.96	95	111	245
Martha	4	Native	3-16-02	3127	3.58	112	131	273

Group 2.—Cows Producing Less Than 150 Pounds of Butter Fat.

Name of Cow.	Age, yr.	Breed.	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	But-ter, lb.	Days in Milk
Jane	3	Native	3-29-02	3684	3.58	132	154	308
Beauty	4	Native	3- 9-02	3580	3.74	134	156	245
Sisie	3	Native	3-19-02	3233	4.23	137	160	273
Roan	8	Native	7-15-02	3697	4.03	149	174	203

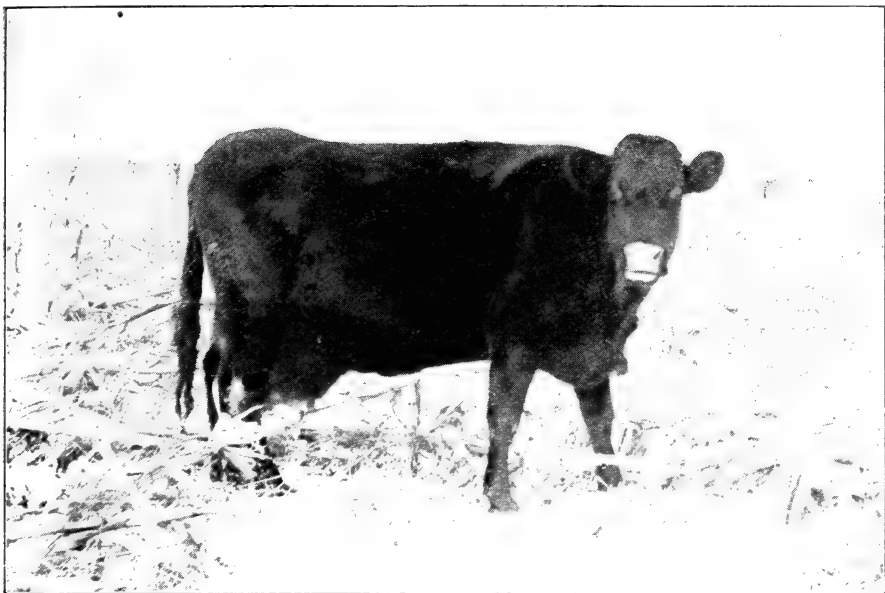
Group 3.—Cows Producing Less Than 175 Pounds of Butter Fat.

Alta	3	Gr. Jersey	12-27-02	3966	4.11	163	190	301
Blue	7	Native	1- 3-02	4883	3.48	170	198	245
Rose	6	Native	3-15-02	4547	3.85	175	204	273

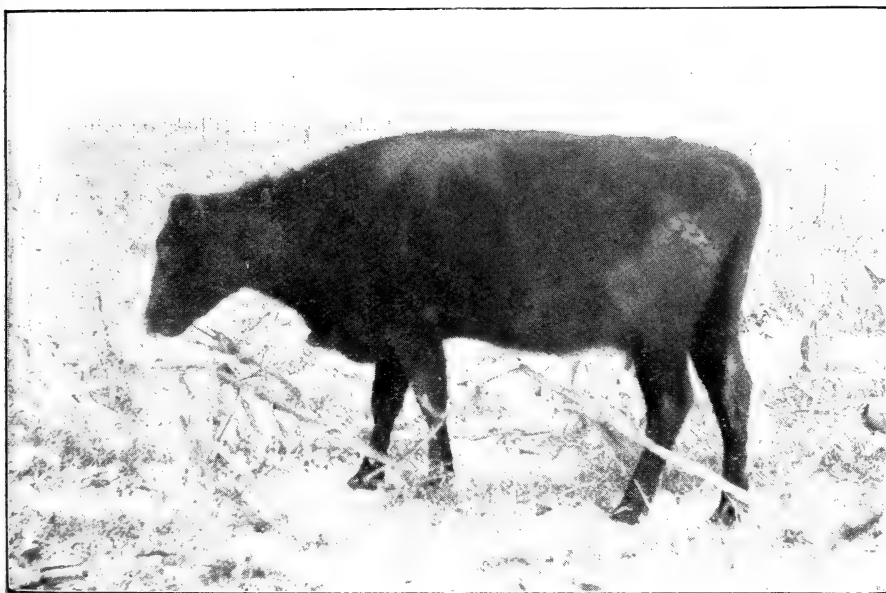
REPORT OF HERD "Q."

In this dairy were found Shorthorns, grade Shorthorns, grade Holsteins, one Jersey, one Jersey-Shorthorn, and one Holstein-Jersey. The owner aimed to keep full blood Shorthorns or high grades, and to build up a class of Shorthorns that were good milkers. A number of the Shorthorn cows made some very good records, but the cows that contained the dairy blood gave the larger average yields. The herd received fairly good care during the test and at times they were fed heavily. When the records of some of these Shorthorn cows are compared with the records of some of the special dairy animals it will be noticed that the records of the Shorthorns are considerable higher, not only in milk flows, but butter production. It is perhaps well to mention that the blood of the cow, Bonny Clay, has been owned by this farmer for many years. The female ancestry of this cow, and of all the full blood Shorthorns have been noted as being good milkers. It might be said that they originated from one cow back in the early sixties. What a pity it is that the blood of such an excellent cow had not been made better use of. The registration should have been kept up and a judicious selection made of her progeny, which should have been bred to carefully selected sires.

The work of testing this herd began May 1 and the dairy received nothing but pasture grass until late in the fall. During the winter months the cows giving the largest flow of milk they received the following:



CUT 15—Brownie. Herd "Q", gave in One Year 6,532 lb. Milk, average test 3.50%; and 254 lb. Butter.



CUT 14—Bonny Clay. Herd "Q", gave in one year 7,060 lb. Milk, average test 4.21%; and 347 lb. Butter.

RATION.

Food Stuff	Lb.	Dry Matter.	Protein.	Carbohydrates.	Fat.
Gluten Meal	4	3.52	1,284	1.648	.100
Corn and cob meal.....	7	5.94	.308	4.200	.203
Corn silage	45	9.40	.405	5.085	.315
Clover hay	5	4.23	.340	1.790	.085
Timothy hay	5	4.34	.140	2.170	.070
Total nutrients	0	27.43	2.477	14.893	.773

This ration is none too large for the Shorthorn cows when they are fresh, for they gave a large flow of milk and weighed from 1200 to 1400 pounds. Perhaps it was not wise to feed as much as 4 pounds of gluten meal, especially, if a cheaper feed could have been substituted for 2 pounds of the gluten.

Yearly Record of Best and Poorest Cow in Herd "Q" and Average for Entire Herd.

	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Best cow, Dutch	8785	3.49	307	358
Poorest cow, Skate	3253	3.75	122	142
Average record of entire herd	5448	3.88	212	247

Table 10.—Record of Each Cow in Herd "Q" for One Year.

Group 1.—Cows Yielding Less Than 170 Pounds of Butter Fat.

Name of Cow.	Age, yr.	Breed.	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.	Days in Milk.
Skate	3	Gr. Holstein	6- 1-02	3252	3.75	122	142	189
Belle	4	Gr. Shorthorn....	6- 3-02	3297	3.82	126	147	182
Sparkle	6	Shorthorn	4-30-02	3289	4.10	135	158	217
Pride	2	Gr. Shorthorn ...	6-12-02	4154	3.54	147	172	240
Brownie, Jr... 8	8	Shorthorn	4-29-02	4205	3.68	163	190	217

Group 2.—Cows Yielding Less Than 250 Pounds of Butter Fat.

Lily	4	Gr. Shorthorn ...	12-26-02	4929	3.98	196	229	294
Jennie	7	Gr. Shorthorn ...	1-11-03	5683	3.80	216	252	266
Brownie	11	Shorthorn	12-23-02	6232	3.50	218	254	240
Pansy	7	Jersey	3-31-02	5408	4.47	242	282	343

Group 3.—Cows Yielding Less Than 310 Pounds of Butter Fat.

Silver Queen .	8	Shorthorn	11-26-02	6553	3.92	257	300	252
Cherry	7	Jer-Shorthorn ...	2-12-03	6624	3.89	258	301	280
Bob	8	Holst. & Jer....	3-20-03	6805	4.07	277	323	252
Bonny Clay ..	5	Shorthorn	10-19-02	7060	4.21	297	347	301
Dutch	12	Gr. Holstein ...	12-29-02	8785	3.49	307	358	343

*Aborted.

REPORT OF HERD "R."

This dairy contained Holsteins, grade Holsteins, Shorthorns and grade Shorthorns. It was a good herd. The records of these cows do not do them full justice for the corn stover was not of very good quality, it being somewhat mouldy, and the owner was so rushed with work that he could not give his dairy the proper attention all the time. The poor corn stover and the lack of competent help are two factors that had a direct bearing upon the record of this herd. The cows during most of the year were well cared for and received a liberal supply of grain together with all the corn stover they would eat. During the summer months the cows received nothing but pasture grass. In the winter they received the following:

RATION.

Food Stuff.	Lb.	Dry Matter.	Protein.	Carbohy- drates.	Fat.
Oil meal	2.5	2.27	.732	.817	.185
Corn meal	12.0	10.69	.948	8.004	.516
Corn stover	20.0	11.90	.340	6.480	.140
Timothy hay	8.0	6.94	.224	3.472	.112
Total nutrients		31.80	2.244	18.773	.953

Of the 20 pounds of corn stover that was fed, not over one-half of it was consumed by the cows.

While this ration contains enough nutrients for cows giving large flows of milk, yet, the combination of oil meal and corn meal make a very concentrated grain ration. Wheat bran or some other light meal substituted for 6 pounds of the corn meal would have made a more palatable and a better ration. The grain part of the ration was fed with finely cut second crop timothy hay. The cows showed no ill effects from this system of feeding and they were in good health when they were turned out to grass. The cut hay helped to lighten the grain part of their feed, which perhaps, accounts for the herd doing so well on the above ration. While the cows appeared to

be in good physical condition and the average production of the herd was good, yet, from the class of cows contained in this herd and the amount of feed that was fed the average production of the dairy should have been larger. Whether the average yield could have been increased by feeding a different combination of grain, and by feeding clover hay, together with a better quality corn stover will always be an open question. Past experiments indicate, however, that the average production would have been larger if the ration contained some clover hay and a few pounds of bran or some other kind of light meal, instead of so much corn meal.

Another question presents itself, does a cow giving 10 pounds of milk a day, require as much grain as a cow giving 40 pounds of milk a day, of equal quality. The system of feeding, practiced in this dairy was to feed about the same amount to every cow, whether she gave little or much milk. Would it not be better to feed the cow according to her individual needs and according to the amount of milk that she produces, rather than to feed every one the same? This method of feeding takes a little more time, but under ordinary conditions will it not pay to give this extra time to such important work as feeding the dairy cow.

Yearly Record of Best and Poorest Cow in Herd "R" and Average for Entire Year.

	Milk, lb.	Fat, %.	Fat, lb	Butter, lb.
Best cow, No. 8	9188	3.75	345	403
Poorest cow, No. 25	4177	2.49	104	121
Average record of entire herd	6603	3.29	217	253

Cow No. 8, the most profitable cow charged 10.2 cents to produce one pound of butter fat and 38.1 cents to produce 100 pounds of milk.

Cow No. 3 charged 20.2 cents to make one pound of butter fat, and 69.9 cents to make 100 pounds of milk.

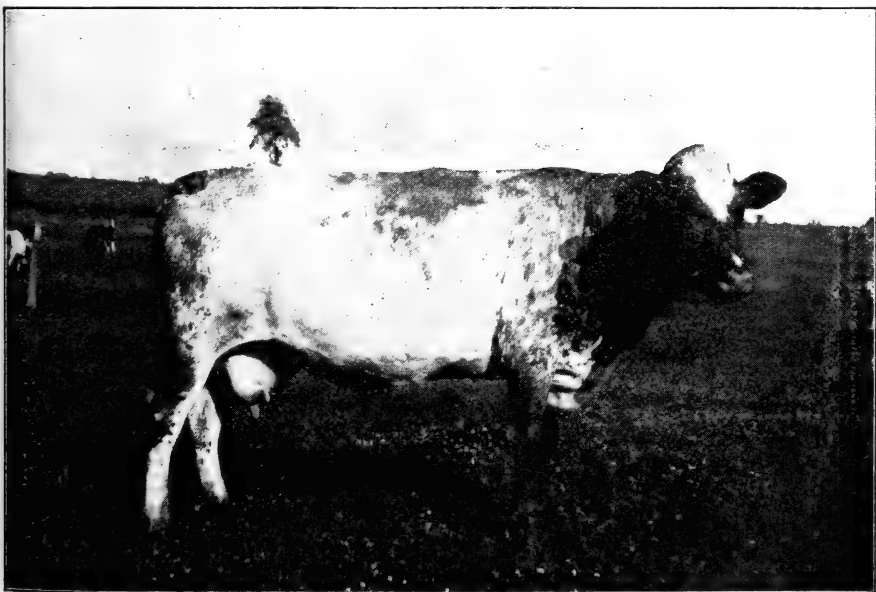
The average cost of this herd to produce 100 pounds of milk was 44.3 cents, and 13.5 cents to produce one pound of butter fat.

Cow No. 8 gave a profit of \$51.97 and Cow No. 3 charged 13 cents for her keeping.

The average profit for each cow in the herd was \$23.19.

The cows in this herd that charged less than \$20.00 for their keep were animals that made most of their records upon pasture grass. This same fact is mentioned more fully in the report of herd "N."

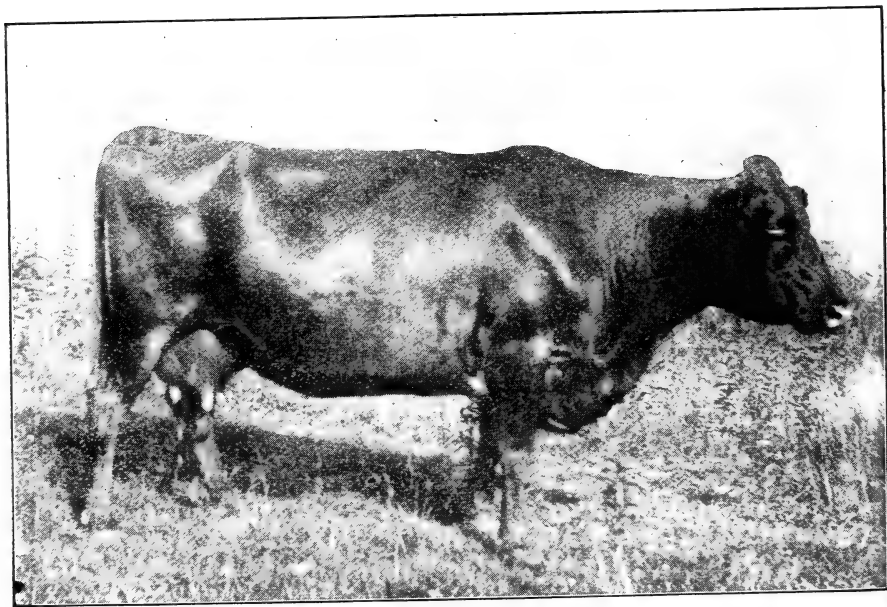
From the cuts of these two cows would it appear to the reader that cow No. 8 is so much better than cow No. 13? On quarter of No. 8's udder is gone, yet she returned a net profit of \$51.97 and cow No. 13 a net profit of only \$15.58. By making this comparison it is not the writer's intention in any way to ignore dairy form, but to bring out the fact that we cannot always determine the value of a cow by her conformation. It should be mentioned that cow No. 8 is 10 years old and No. 13 is 12 years old.



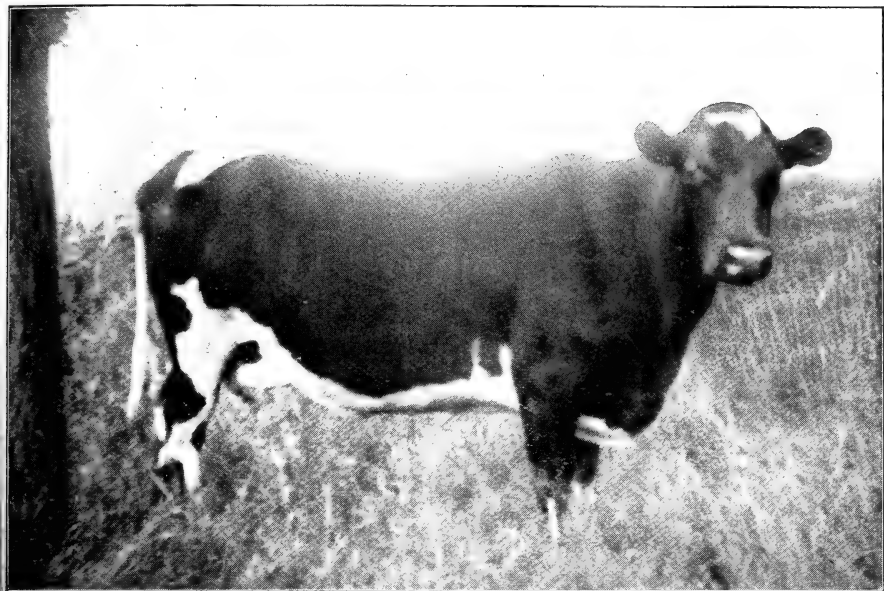
CUT 17—Cow No. 8, Herd "R", gave in one year 9,188 lb. milk; average test 3.75%, 403 lb. butter; net profit \$51.97. She charged 38.1 cents to produce 100 pounds of milk, and 10.2 cents to make one pound of butter 'at.



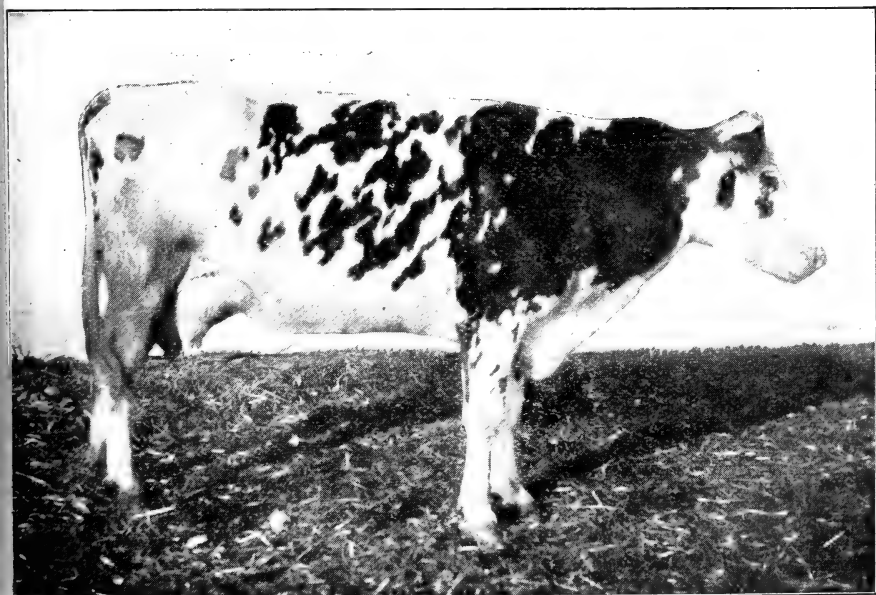
CUT 18—Cow No. 13, Herd "R", gave in one year 6,252 lb. milk; average test 3.29%; 240 lb. butter; net profit \$15.58. She charged 54.5 cents to produce 100 pounds of milk, and 13.5 cents to make one pound of butter fat.



CUT 16—Cow No. 17, Herd "R", gave in one year 8,012 lb. Milk; average test 3.57%; and 334 lb. Butter; net profit \$44.03.



CUT 19—Cow No. 32, Herd "R", gave in one year 8,588 lb. milk; average test 81%; 382 lb. butter; net profit \$36.98. She charged 45.0 cents to produce 100 pounds of milk, and 11.8 cents to make one pound of butter fat.



CUT 20—Cow No. 18, Herd "R", gave in one year 9,272 lb. milk; average test 57%; 278 lb. butter; net profit \$24.32. She charged 37.5 cents to produce 100 pounds of milk, and 14.6 cents for one pound of butter fat.

In comparing cows Nos. 32 and 18 it is interesting to note the great difference in their test. Who could have guessed by simply milking these two cows that No. 32 would have made 104 pounds more butter than No. 18? From which of these animals should calves for the dairy be selected. It is reasonable to suppose that any one would select the calves from No. 32, for she produced nearly as much milk as cow No. 18, besides it tested 3.81 per cent fat while the milk from cow No. 18 was much below standard, only testing 2.57 per cent fat.

Will it not pay the shipper or the man who sells his milk to the Condensing Factory to test his dairy? The record of cow No. 32 shows that it is possible to have a dairy that will give a large flow of good standard milk. But how shall a herd of this kind be obtained without weighing and testing each cow's milk? It is quite as important to know the good testing individuals as it is to know the ones that produce large flows of milk. The quality of the product as well as the quantity that the cow produces should always be considered when selecting calves for the future dairy.

A few tables comparing cows Nos. 8 and 13 in herd "R," under actual and under possible conditions may help to bring out what it really means to have one animal give a net profit of \$51.97 and another one only \$15.58.

Table 11.—Comparing the Actual Results of Cows No. 8 and No. 13.

Number of Cow.	Cost of Feed.	Net. Profit.	Net. Loss.
8	\$35.03	\$51.97	.....
13	34.09	15.58	.....

If the price of butter fat were only 15 cents a pound, instead of 25 cents, the average price for which their butter fat sold, and the cost of their feed being the same, the results would be as follows:

Table 12.

Number of Cow.	Cost of Feed.	Net. Profit.	Net. Loss.
8	\$35.03	\$16.72	.....
13	34.09	.....	3.19

Let us suppose that it costs \$10.00 more apiece to board the cows, which is possible when prices of feed are very high, and we have the following results:

Table 13.

Number of Cow.	Cost of Feed.	Net. Profit.	Net. Loss.
8	\$45.03	\$41.97	....
13	44.09	5.58	....

If the prices of butter fat were only 20 cents a pound, instead of 25 cents, and the cost of their feed being the same, as assumed in table—the results would be as follows:

Table 14.

Number of Cow.	Cost of Feed.	Net. Profit.	Net. Loss.
8	\$45.03	\$23.97	....
13	44.09	....	\$2.89

Table 15.—Showing Profit or Loss for Each Cow in Herd "R" for One Year.
Group 1.—Kept at a Loss.

No. of Cow.	Milk, lb.	Fat, %.	Fat, lb.	Butter lb.	Gross Returns.	Cost of Feed.	Profit or Loss.
3	4030	3.45	139	162	\$28.05	\$28.18	\$.13

Group 2.—Kept at a Small Profit.

20	5667	2.96	168	196	\$39.46	\$36.09	\$3.37
16	5150	3.42	176	205	42.95	35.03	7.92
22	5286	3.20	169	197	42.88	34.03	8.85
25	4177	2.73	114	133	26.47	17.49	8.98
1	5367	3.43	184	215	44.78	34.10	10.68

Group 3.—Kept at a Fair Profit.

11	6201	2.85	177	217	\$43.22	\$31.06	\$12.16
15	3869	3.52	136	159	32.74	18.85	13.89
4	5234	3.84	201	235	49.32	34.01	15.31
5	6618	3.05	202	236	50.40	35.03	15.37
13	6252	3.29	206	240	49.67	34.09	15.58

Group 4.—Kept at a Very Fair Profit.

2	7114	2.68	191	223	\$49.56	\$33.03	\$16.53
14	4983	4.01	200	233	49.75	33.01	16.74
26	6952	3.05	212	247	53.60	34.03	19.57
33	5944	3.18	219	256	53.00	33.09	19.91
35	5202	3.17	165	193	39.67	18.96	20.71
30	6695	3.11	208	243	48.92	27.90	21.02
29	4717	3.46	163	190	37.27	16.11	21.16

Group 5.—Kept at a Good Profit.

No. of Cow.	Milk, lb.	Fat, %.	Fat, lb.	Butter lb.	Gross Returns.	Cost of Feed.	Profit or Loss.
21	7203	2.96	213	249	\$50.40	\$27.91	\$22.49
10	6725	3.38	227	265	56.11	33.01	23.10
28	7161	2.99	214	250	52.52	28.41	24.11
18	9272	2.57	238	278	59.06	34.74	24.32
31	5076	3.35	170	198	38.19	13.50	24.69
6	7683	3.07	236	275	59.97	34.17	25.80
7	7453	3.35	250	292	60.94	35.10	25.84
19	6935	3.49	242	282	60.17	34.23	25.94

Group 6.—Kept at a Very Good Profit.

34	5572	3.64	203	237	\$45.83	\$15.47	\$30.36
24	7475	3.25	243	284	60.45	30.07	30.33
37	8702	3.42	298	348	61.84	29.02	32.82
12	7713	3.38	261	305	62.63	29.21	33.42
23	7342	3.45	253	295	58.08	22.79	35.29
32	8588	3.81	327	382	75.65	38.67	36.98
9	7429	3.39	252	294	58.66	20.96	37.70

Group 7.—Kept at an Excellent Profit.

36	9592	3.08	295	344	\$74.28	\$34.09	\$40.19
27	7792	3.41	266	310	61.98	21.00	40.98
17	8012	3.57	286	334	76.12	32.09	44.03
8	9183	3.75	345	403	87.00	35.03	51.97

Table 16.—Record of Each Cow in Herd "R" for One Year.

Group 1.—Cows Producing Less Than 175 Pounds of Butter Fat.

No. of Cow.	Age, yr.	Breed.	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.	Days, in Milk
25	6	Holstein	3- 5-03	4177	2.73	114	133	224
15	9	Gr. Shorthorn ...	2- 1-02	3869	3.52	137	160	308
3	4	Gr. Shorthorn ...	6-20-02	4030	3.45	139	162	279
29	6	Gr. Shorthorn ...	2-23-03	4717	3.46	163	190	220
35	8	Gr. Shorthorn ...	2-15-03	5202	3.17	165	193	210
20	10	Holstein	8-15-01	5667	2.96	168	196	365
22	3	Gr. Shorthorn ...	7-15-02	5286	3.20	169	197	325
31	10	Gr. Shorthorn....	4-12-03	5076	3.35	170	198	217

Group 2.—Cows Producing Less Than 215 Pounds of Butter Fat.

No. of Cow.	Age, yr.	Breed.	Date of Calving.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.	Days in Milk.
16	3	Gr. Shorthorn ...	7- 7-02	5150	3.42	176	205	330
11	5	Gr. Shorthorn ...	12- 1-02	6201	2.85	177	207	270
1	4	Gr. Shorthorn ...	8-15-02	5367	3.43	184	215	270
2	9	Holstein	9-22-02	7114	2.68	191	223	270
14		Gr. Shorthorn ...	8-22-02	4983	4.01	200	233	255
4		Gr. Shorthorn ...	7-15-02	5234	3.84	201	235	260
5	8	Holstein	9- 8-02	6618	3.05	202	236	333
34	8	Gr. Shorthorn ...	3-20-03	5572	3.64	203	237	227
13	12	Gr. Holstein	3- 1-02	6252	3.29	206	240	308
30	9	Gr. Holstein	1- 3-03	6695	3.11	208	243	311
26	7	Holstein	9- 8-02	6952	3.05	212	247	308
21	8	Holstein	12-25-02	7203	2.96	213	249	276
28	5	Holstein	12-20-02	7161	2.99	214	250	270

Group 3.—Cows Producing Less Than 255 Pounds of Butter Fat.

33	5	Holstein	7-15-02	5944	3.68	219	256	276
10		Gr. Shorthorn ...	7-15-02	6725	3.38	227	265	257
6	6	Holstein	9- 8-02	7683	3.07	236	275	310
18	6	Holstein	8-15-02	9272	2.57	238	278	307
19	11	Gr. Shorthorn ...	10-25-02	6935	3.49	242	282	332
24	9	Gr. Polled Angus.	12-...-02	7475	3.25	243	284	280
7	8	Gr. Shorthorn ...	8-24-02	7453	3.35	250	292	311
9	12	Gr. Holstein	2- 1-02	7429	3.39	252	294	250
23	3	Gr. Holstein	1-15-03	7342	3.45	253	295	277

Group 4.—Cows Producing Less Than 350 Pounds of Butter Fat.

12	10	Gr. Shorthorn...	12-10-02	7713	3.38	261	305	277
27	6	Holstein	3- 6-02	7792	3.41	266	310	270
17	12	Gr. Shorthorn ...	9-18-02	8012	3.57	286	334	245
36	7	Holstein	10-20-02	9592	3.08	295	344	311
37	6	Holstein	11-28-02	8702	3.42	298	348	274
32	5	Holstein	*9-15-02	8588	3.81	327	382	350
8	10	Gr. Shorthorn ...	9-15-02	9188	3.75	345	403	310

*Aborted.

Table 17.—Comparing the Performance of Five of the Best Cows Kept in Different Herds, Making Less Than 275 Pounds of Butter Fat.

Name of Cow.	Herd.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Rose	P	4547	3.85	175	204
No. 3	L	5958	3.86	230	268
Tabo	M	6146	4.10	252	294
Cherry	O	6606	3.84	254	296
No. 2	I	6919	3.88	268	313

Table 18.—Comparing the Performance of Five of the Best Cows Kept in Different Herds Making Less Than 415 Pounds of Butter Fat.

Name of Cow.	Herd.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
No. 4	J	7393	3.73	276	322
No. 7	K	6623	4.61	305	356
Dutch	Q	8785	3.49	307	358
No. 8	R	9188	3.75	345	403
Pet	N	8230	5.03	414	483

Table 19.—Comparing the Performance of Five of the Poorest Cows Kept in Different Herds, Making Less Than 105 Pounds of Butter Fat.

Name of Cow.	Herd.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
Bob	P	1866	4.13	77	90
Mamie	N	1986	4.78	95	111
No. 13	L	2658	3.65	97	113
Speck	O	2496	4.09	102	119
No. 25	R	4177	2.49	104	121

Table 20.—Comparing the Performance of Five of the Poorest Cows Kept in Different Herds, Making Less Than 145 Pounds of Butter Fat.

Name of Cow.	Herd.	Milk, lb.	Fat, %.	Fat, lb.	Butter, lb.
No. 3	I	2914	4.02	117	137
Skate	Q	3253	3.75	122	142
Shorty	M	2677	4.86	130	152
No. 1	K	3923	3.54	139	162
No. 2	J	3875	3.66	142	166

Table 21.—Comparing the Average Performance of all the Cows in Five Herds, Making Less Than 230 Pounds of Butter.

Herd.	Milk, lb.	Fat, %.	Butter, lb.
P	3397	3.86	153
L	3891	4.04	183
O	4233	3.85	190
M	4052	4.76	226
J	4779	4.08	228

Table 22.—Comparing the Average Performance of al the Cows in Five Herds, Making Less Than 310 Pounds of Butter.

Herd.	Milk, lb.	Fat, %.	Butter, lb.
I	5174	3.92	237
Q	5448	3.88	247
R	6603	3.29	253
K	5711	3.99	266
N	5642	4.68	308

DISCUSSION.

Mr. Cobb:—Tell why one cow is better than the other.

Mr. Glover:—Spotty is larger just in front of her udder and her digestive powers are bigger. She makes 288 pounds of butter in a year. Spotty makes her owner money and Red Bird charges \$1.00 for her board.

Mr. Lindley:—What prices do you get for milk?

A:—85 cents per 100.

Q:—Why we get \$1.22½ per 100.

A:—Well I have figured on creamery prices as most of my cows go to the creameries.

Q:—I speak of this so our people here will know on what you are figuring.

A:—Yes, I am glad you spoke of it. Any time you may ask questions.

Milk fever more often comes from exposure than from over-feeding. There is no district that feeds her cattle any better than the Elgin district, and I have yet to see a case of milk fever from over-feeding.

Mr. Newman:—We know we are in a milk producing district and that some of our friends will have to go early on account of milking. I hope you will be free to come and go as you please, and trust you will all be here tonight.

Mr. Cobb:—This book that Mr. Glover is holding in his hand is this dairy report and there are some of the books here for those who like them.

Mr. Newman:—Your work in the north has been good, and I believe some men have discarded their old herds and bought new ones?

Mr. Glover:—It would seem that way. Several men in the Elgin district have been using every effort to buy in a higher class of dairy cows, and they tell me that the work has had effect. Some have increased 20 per cent in production by weeding out a few of his poor cows and replacing them with better ones.

Q:—A member. Where can you buy those kind of cows?

A:—That is a hard question to answer. The only way is to buy a few good cows and breed from them.

Q:—It doesn't seem to me that one year will decide what a cow will do?

A:—That's true. The Babcock test is not the whole thing by any means. We must look at it with consideration and try the test the second year. Sometimes a cow will not do very well the first year, and the next year will do fine. I had a man on my list that was fixed that way and he said he would sell them, but I told him to hold them, and this year they gave 40 pounds of milk a day.

Q:—I would like a suggestion as to how long you ought to let this test go on?

A:—If the cow's ancestry is good and this cow did a poor year's work, I would not discard her with the first year's test, I would try her again. But I would want to see her a pretty good looking individual.

Q:—I know of a full blooded Jersey, the finest type, and while her milk is very rich it is in such a small quantity that I don't believe the cow will pay for itself. What can you offer as to what to do with that cow?

A:—The butcher is probably the best way. But I can't say without seeing her. Does she digest her food properly?

Q:—This cow seems to digest her food pretty well.

A:—Well I can't tell. If she does not do good this year I should discard her.

Mr. Cobb:—I have with me some milk sheets and they are on exhibition and it is just along this line, that of knowing what to do. I would like to have you inspect them.

Mr. Lindley:—I wonder why you haven't entered this field down here. The University is testing three herds in this vicinity, one about eight or ten miles below here and Freese's herd

and a herd north of us, and we have a little bit of the benefit of the University work. We will soon catch up with Mr. Cobb I believe.

By the President:—I want to see the money divided all over the state. We want the people in the middle and southern part of the state to have their share. Mr Glover tells me that in the past two years, or nearly two years, as I understand his answer that some had increased their herds 20 per cent. Do you know what that means if we could get it all over the state—over one million dollars. That income was over thirty million, and 20 per cent on that would bring an income to the farmers in Illinois of six million dollars in one year. It would be worth paying out taxes of \$75.00 or \$100. It would be policy for the state to grant us this money; it is a stupendous thing. I think Mr. Gurler's statement of expecting 300 pounds butter fat to a cow is not extraordinary. It is double what the whole state is doing now. You can bring your cows to 300 pounds a year with ordinary intelligence, and we will come to this. That is the reason I asked Mr. Gurler the question about his work. We are doing a wise thing in this particular branch of agriculture.

A member. Q:—What age do you think it is best to test cows?

A:—5 to 10. I have tested some 18 years of age and you would be surprised at the records.

Q:—How long ought a cow to be turned dry?

A:—Six weeks to two months.

Q:—You spoke about the feed to a cow before she comes in?

A:—Feed a cow very lightly just before she calves.

Mr. Lindley. Q:—You said that a cow that had milk fever, got milk fever from exposure?

A:—More so than any other source.

Q:—Exposure in the summer time?

A:—In the damp wet nights.

Q:—There are not very many wet damp nights here in this locality we don't have the rain here.

A:—Well I am glad of it. No rain and no cool nights I say more cows are lost from exposure than from over-feeding.

Mr. Lindley:—Never have milk fever if you milk the cows fresh out?

Mr. Gurler:—He says that one of the causes is this. When we dry off our cows whatever time it is, that after what we call dry there is a little secretion takes place and gets in the udder. If you go to work and milk that out that poison entirely disappears and very little fever will follow.

Mr. Lindley. Q:—What time would you milk that?

A:—A week in the pasture and know she is dry, go to that cow and milk it out of her.

Q:—Before she calves?

A:—Yes sir, before she ever starts off to make udder. That secretion is apt to be in the system.

Q:—I lost two last year with milk fever.

A:—It is a very serious disease. I would advise you trying to get rid of this little secretion.

Q:—It seems to be one thing we have to fight in this locality.

Mrs. Purviance:—You say it never rains here, maybe if you gave them more water they would not have so much fever.

Q:—We have artesian wells here and they can have all they want of water, and we are careful about giving laxative food to our animals.

Mr. Gurler:—This idea of getting rid of this poison is a very good one and you should try it.

Q:—Is milk fever contagious?

A:—I don't think so.

Mr. Cobb:—I never had a case of it.

Mr. Gurler:—We are not troubled in the Elgin district with it. I have had two cases and the Smith system cured it.

By the President. The meeting this evening will be the best on the program. Mrs. Purviance of the Buttermakers As-

sociation of Lincoln, Illinois, Mr. Pethybridge of the Milk Inspectors of St. Louis is here and has something to say about delivery of milk in St. Louis. He has little bulletins that he wishes to circulate on the ordinance of delivering of milk in St. Louis and if you are interested in this he will be pleased to hand them to you.

I will appoint a committee on memberships. We would like to have you all join the Association. There is a nominal fee asked to help pay for the meetings, and the report alone is worth the price. One dollar is asked and it entitles you to a report of this meeting when printed, and the book from the last meeting and a vote on all questions brought up at this convention. I appoint—

L. A. Spies of St. Jacobs, Ill.

A. J. Shearer of Aurora, Ill.

Tallie Defrees of Greenville, Ill.

John Christ, Washington, Ill.

The rest of the committees I will appoint later, perhaps tonight.

I also want to say that we want all those who have come from out of town and brought certificates, to hand them to the Secretary, because we have to have 100 of these certificates to get the reduced rate on the return ticket. Don't forget this and I will try and keep you reminded of it.

Here are the reports of last year to which you are welcome.

We will stand adjourned until evening at 7:15 p. m.

The Secretary has a lot of membership tickets he would like to dispose of.

TUESDAY EVENING SESSION

Meeting called to order by President.

The Greenville Quartette has kindly offered to give us some music. Encored.

By the President.—We have with us the President of the Buttermakers' Association of Illinois, Mrs. H. P. Purviance of Lincoln, Illinois.

ADDRESS.

By Mrs. H. P. Purviance, of Lincoln, Illinois.

Mr. President, Ladies and Gentlemen.

Dairying has become a science, and only a man that has studied all the different methods and plans can succeed in farming. The time has been when all a farmer had to think of was to raise corn, wheat, oats and grass, formerly he did not have to think of the soil or whether he could raise enough to feed his stock and pay expenses.

There are very few farms in central Illinois that are not worth from \$100 to \$150 per acre. The question naturally arises, how can I farm this land? How can I farm it so as to make it a paying investment, and at the same time keep up the fertility of the soil. There is no way in which the fertility can be preserved better than in dairying and especially by making butter, for it is a known fact that in selling butter one sells the least possible

amount of fertility from the soil. Then why not every farmer keep a few cows and learn to make good butter. There is nothing that will make him money quicker and easier than cows and hogs, they always go together.

I do not want him to get cows before he has a place suitable to keep them, but as fast as he can do so, get good cows and raise all your heifer calves, or, if you can buy good ones at a reasonable price, by all means do so.

In the winter you have to feed your cows, so have your lots hog tight, and let your hogs run after the cows. Then have a separator, not one of the cold water tin pans that so many agents and fakers are praising, but get a centrifugal separator, separate your milk and feed to your hogs and calves while warm.

If you have small pigs you can make a slop for them and you will be surprised to see how fat and fast they will grow. Now have a good warm stable to put your cows in every day, take your manure spreader and take the manure out on your farm.

The majority of farmers have only their horse barns, which they clean out and pile up against the barn to keep the horse warm, while they let the poor cows stand out in the lot to shiver and shake and barely give enough milk to keep a family of three or four with butter.

Let me tell you something I personally know. Put in your wheat and put on a light covering of manure in the fall, don't be afraid you will scald it, and your wheat will not be so liable to freeze out and the Hessian fly will never trouble you, and your yield will be much larger. Again, if the manure is kept cleaned away from the barns, you do away with multitudes of diseases, germs, and the bacteria that contaminates our milk, thereby causing many cases of poorly flavored butter which otherwise would have been good. Again, think of the benefit the soil would have derived if the manure lay on the ground all winter.

The practical farmer will see that his fields receive fertilizing each year; that all burrs, thistles and obnoxious weeds are pulled and destroyed every year, for they take so much strength

and substance from the soil which should have been given to the grain.

Another point, the same cow that stands out of doors consumes more feed and gives you less milk than one that is kept in a comfortable shelter. You could soon pay for the barn with the increase of milk and the saving of grain you would have to feed, and in the building up of your land, while the wife has a better income from the larger amount of butter she would have to sell. I read an article in one of the dairy papers in December saying it was estimated that one cow would furnish you \$19.00 worth of fertilizer each year. Now she ought to make a pound of butter a day for at least ten months. We will say 240 pounds as an average of what most farmers' cows make. If sold at 25 cents per pound, plus the \$19.00, will it not pay the farmer? Besides, he has the calf and the milk.

I have noticed many times that the man who makes a success in farming is the man who keeps cows and makes butter or sells milk, who raises stock and who keeps his barn lots clean, and his fields covered with his fertilizer, not put on just when he should be putting in his oats, but put there every day during the fall and winter when the land can be absorbing the plant food. The time has come when we have to take advantage of every practical method to succeed on the farm.

The difficulty of getting good help and to farm as we would like to has been against us, but I believe the time is not far away when help will be plentiful, and I feel confident that with the growing interest of all classes that the dairy interest will be increased.

We should strive to increase our product this year as we have our World's Fair, and the demand will be very large, and it should be our aim to make not only more, but better, butter. To do so all our farmers must help us and by so doing they will help in supplying the two most needed articles of food, butter and milk.

I was very much gratified to see the increase of interest taken in our county this winter at our Farmers' Institute in the

dairy work. Farmers that in the past laughed at our Institutes and our butter exhibits, now are our most enthusiastic workers and their butter now scores with the best at our last meeting. Out of forty entries, only three were below ninety, our highest score 97.

The northern and southern counties of Illinois are well supplied with dairies and creameries and we know are doing good work, but what the State Dairy Women's Association wants to do is to get the central part of the state organized as you in the northern and southern sections are organized, and to encourage more farmers to go into the dairy work.

We feel the need of more and better butter. Our grocery men are insisting on some method of ruling out the poor grade of butter, and the graded system will do it. A 1 butter should be taken to your market and be sold according to score. It would pay the grocery men of a city of any size to hire a man by the year to score all butter. That would rule out this imposition so many merchants have to contend with, or at least the producers could be taught so as to be able to judge or score their butter, and all butter to grade not less than 90. If it scored lower to receive a lower price, and if above that to receive as high as any dairy or creamery butter. We can see no better method than by getting all the counties organized, and by having meetings with demonstrations thereby instructing all how to feed the cows and milk them and to care for the cream, and to make the best butter.

Our Farmers' Institutes have been a help to us, let us have our meetings, our demonstrations and our state butter shows thereby getting more opportunities of scoring our butter to see what improvement we are making. There are so many points to learn in the making of butter in summer and winter, with dry feeds it is harder to get a good flavor than with grass. Still it is just as hard to make a good flavored butter when first turning on grass in the spring.

I think there is one thing that has kept a great many people from going into this work, and that has been the lack of pasture, but that need not keep any one out any longer.

It has been thoroughly demonstrated that with the silo we have all that the farmer needs in the way of pasture, and he has the cheapest and the best feed, then you can have more land for cultivation, or, in other words, with the silo you can carry a greater amount of stock on the same amount of land.

Some of the farmers will say we do not own our farms, we can not build silos, which is true, but you can not afford to farm without stock, and the cow brings you in the ready money and furnishes you your fertilizer, so you can not afford to do without her.

By the President. We will now have an instrumental solo by Miss Carson.

Encored.

By the President. We have with us tonight one who needs no introduction to this audience; one of those dairy farmers who is probably doing more for his country than any one else in it, the Hon. C. J. Lindley.

ADDRESS.

Hon. C. J. Lindley.

Mr. President, Ladies and Gentlemen.

I think possibly that the President don't know this country as well as those who live here.

I feel as though I owed an apology for not preparing an address for tonight. I have been away from home and been pretty busy, and ask your pardon if I talk at random. After I am through you will listen to our good friend from Chicago, the Pure Food Commissioner. I will not tell you what he tells me to tell you.

We are very glad to have with us the State Dairymen's Association. I was reading the other night in the National Report of Agriculture that the dairy business in the United States was over a century old, but that the improvements had all been made in the last half a century. I want to say to those who are visiting here that that record is nothing in comparison with the record of our own county here.

We commenced the dairy business in earnest about three years ago. Before that there was delivered at this depot and shipped to the city from this depot, some milk, but when the Helvetia Condensed Milk Company commenced, we commenced the dairy business in earnest, and in three years I think our people here have made more rapid progress in dairying than any section of the United States or any other country. I am satisfied by June this year there will be delivered to our two condensers 150,000 pounds of milk every morning.

Last year when they commenced to look around to see what capacity they should make in the condenser, we suggested they make it 70,000 pounds daily, and some thought that was more than we could possibly do; but they would take all the milk up to 70,000, and we lacked 30 pounds one day during that time of reaching the limit. They will increase that plant 10,000 to 25,000 and we propose to give them all they can use. I want to say to the President that that is the effort we expect to make. That is not such a great increase as far as that is concerned.

We have in this vicinity 600 producers of milk and if they will add three cows to every herd it will make the amount of milk necessary to produce 10,000 pounds.

I am a little surprised at the remarks of some of the gentlemen, as to the price of milk which they figure their cows at in the Experiment Station tests that they are making over the state. We must be very very fortunate in this section of the country if that price is the price they received. We will get this year for our milk from the condenser \$1.26 $\frac{1}{4}$ c per 100 the year around. That ought to be encouragement to us who are producing milk, when

we are producing it on cheaper land than those in the northern part of the state.

If our visiting brother will pardon me, I would like to say a few words about southern Illinois. In traveling over the state, I have met with a good many men who have a very poor opinion of southern Illinois, as far as its products are concerned, or the industry of the people. I want to say to you tonight that no section of this state, and no section of any other state in the union in the last ten years has developed like southern Illinois. It has averaged in the last five years the placing of a bank to each county, and the deposits in the banks of southern Illinois have doubled in the last eight years. Coal fields have been opened and we have an abundance in Illinois of coal and some run to twenty feet, many of them are worked at 30 feet. We have coal all over our section of the county, and in this section here if we go down 48 to 60 or 70 feet have coal. The county has increased in the way of producing fruit and a great deal of the fruit you have in the northern part of the state you get from the south part of Illinois. Not only that but the dairies in southern Illinois have increased.

I call your attention to this to show you that you are not in the land of Egypt in the sneering way in which it is used, but in that Egypt that is the producer of not only corn, but other products for the happiness and welfare of mankind.

The question of farming is the important question of agriculture I should have said. In speaking of the many interests here, I desire to call attention to a difficulty under which we labor, and the gentlemen who have been making some speeches today called attention to the perfect dairy cow, and what we should have as a perfect dairy cow, and I want to call your attention to how difficult it would be for any section, not in the dairy business, to add five or six cows and to raise their calves not having raised them down here. We have done well to do what we have done or rather what we will have done by next June.

I was asking a gentleman today about this question of procuring dairy cows, and what he thought about it, and he said it

was a difficult question. The result is, every one says we ought to raise them. But we are not in position to raise cows. We have somewhere about 35 on my places that we have raised and some of them are milking now and some next spring. We are just getting into that work.

The question of farming is a question which interests every one in the business. We hear a great deal about scientific farming, but I am not in a position to speak on scientific farming. I can speak from experience as a farmer. From the time I can remember I have always been on a farm.

The question that now confronts us is entirely different from the early days of most of us who have reached forty or fifty years. We know all about farming then by tradition by it being handed down, and only of late years is it we have heard of experiment stations and tests of the soil and analysis and fertilization which are for our advantage, and yet those who preceded us had advantages we do not have and that is, the fertility of the soil. In early days there was a great deal of stock raising and the people thought possibly that was the best way to make money on the farm, and you remember our western prairies raised so much cattle some were forced to raising grain and then wheat, and a great many who raised cattle in the '70's are trying to get back their fortunes by raising wheat and corn and selling it. Finally the country got in such condition, the fly and bug and every animal or insect that could get at the grain, they got us in such a condition that we are not raising wheat, couldn't raise it, and we find out that the best thing to do is to feed everything you raised on the farm and try to help the fertility as much as possible. We were almost in despair when the condenser came here and helped us out by getting us to produce milk. We are feeding everything we raise on the farm to our cows and we are buying stuff and shipping it here and buying from the farmers who have surplus stock and we are feeding it and use the fertilizer on the farm and I think it is very profitable.

As far as fertilization is concerned, I was talking at the hotel with some gentlemen and I found that they were against

commercial fertilizers, but I believe we can use commercial fertilizers to an advantage, and it is our purpose this year to try some. We propose to use on one of our places commercial fertilizer with oats and corn and see what the result will be. It is impossible to fertilize all of our land with our cows, they do not produce enough. They tell us a cow ought to fertilize an acre of land. Maybe that is so.

I also heard some of them talking about selling our products. Some of our friends contend that it is not profitable to sell the whole of the milk products of the farm, and our lady friend on buttermaking presents that idea. I think that idea is all right for people who live in a community where they are not accessible to the market and get a price sufficient to make the difference between the value of the skim milk and the entire product. If I lived in a community where I could not sell to a condensor at \$1.26 $\frac{1}{4}$ the year around, why I would try to have a separator and separate the cream and feed the milk on the farm; otherwise it is necessary for us to feed our cows and to raise our hogs in a different way.

Another thing, I see on the program that some one is to talk on "How to Make the Most Money Out of Our High Priced Land." I want to make a suggestion to those who are trying to make money out of their high priced land, to those who are trying to solve that problem. I want to suggest to them that they sell it and come down here in this portion of the country where you can get land at a lower price and make a better profit. I can help those fellows out very much. Just think of it now! Land here within fifty miles of the great city of St. Louis, close to the county seat, with 3,500 inhabitants, without any saloons, though that might not be desirable to some of you, and with all the educational facilities that are possible for a city to have and with the best of schools and that is what we have here. In fact, the schools are so good that they have commenced having examinations for boys to go to West Point and to the Military Schools and we were put in competition with Madison County and all the rest and we never fail to take off the prizes, two West Point and two to Annapolis

and had to quit because they got all the boys. We will soon have, not only the steam railroad, but electric roads and the only thing we need is hard roads, and in a community paying out half a million dollars to the farmers—where you can buy land from \$30 to \$50 an acre, and I say to you that the only regret that the executive committee have in this meeting is that we could not carry out the idea we wanted to, to take you visitors over this country and show you our land and improvements and show you our dairy barns and how we care for things as compared with the northern part of the state. I want you to tell your friends with that \$150 land and trying to make a profit, tell them to come here where they can buy cheaper land and make more money.

It is not necessary for me to go into the discussion of how to take care of dairy cows. I see many of the city people here and they are not interested in the direct care of milk and mode of taking care of the dairy cow, but they must be interested in the farmer making money because they try to get it as soon as the farmers get to town, and they would be bored with remarks along that line.

We expect to learn at these meetings a good deal about dairying, and I am a little surprised that you should have a dairy meeting or a farmers' instituting meeting in this state without having our good sisters on the improved cooking questions.

On the Appropriation Committee at Springfield there was Judge Sherman who is a very slim gentleman. He weighed about 130 pounds, lean, lank and long, but very brilliant, and we had up one day the appropriation for the Fair Grounds, and the lady was asking for an appropriation of \$50,000 for the Women's Building and Domestic Science. One of the ladies got up before the Committee and said it was necessary that we should have Domestic Science schools in the state that they might teach the boys and girls how to cook. When they used to cook bread in those long loaves and three or four in a pan, of course you could not cook the starch globules in the middle of the loaf, and after she was through telling us that, a member of the Committee

weighing 200 said "Pardon me for referring to family history a little, but my father and aunt and grandmother cooked bread in that way and three or four loaves in a pan, and my grandmother lived to be 99½ years old and had a daughter about 80 and sons 70 and 75 and my father was 72 and they all weighed about 200, and I married a little girl in the country who never heard of Domestic Science, nor of cooking your way, I guess Sherman is an example of Domestic Science, and I am an example of the old way of cooking.

I am a little bit surprised we have no Domestic Science educators here.

Referring back again to what I said about our Committee. We are in earnest in this, and we invite as many of our friends from the north to inspect our country and when you leave here you will have a good feeling for southern Illinois. We produce good corn. We can raise cow peas and you can't; better hay than you can and just as good clover when we get the ground in condition and we all raise wheat, and we can raise all the food that is necessary for the cow.

I was talking with a gentleman today and I wished to call attention to our shredded fodder. We have an advantage over you, we can plant cow peas with our fodder and cut them together. I was reading the other day in the National Report of Agriculture of the most prominent dairyman in Indiana who has a Jersey herd that was the most valuable producers on his farm, and he accounted for it for having shredded fodder, and to those of our friends who are here I want to insist upon the value of shredded fodder. When I was young and on the farm I had to do that job, and I always swore that if ever I saw a machine that would shuck fodder corn I'd get it, and I think I bought the first one I ever saw and we have used it ever since, and had the best results from it of anything we have had. We can raise anything up here and we invite you to come and see us.

We were discussing the milk fever question some time ago, and I would like to say that up in the northern part of the state they do not have the intense hot weather that we have here. We

do not have this fever in the fall or winter, only in the intense hot weather, and you do not have that difficulty to contend with. I merely wish to make this statement.

I would like to answer any questions about our county here or anything of that kind.

By the President. In regard to soil here, you spoke of using a fertilizer, and when ground was prepared could grow clover. What do you mean by that?

A:—We have a light soil here and all of our timber soil and where the land is on the water courses it will surely produce clover, but some of our prairie land will not produce it without using cow peas, only in certain seasons. When the seasons are good it will produce clover. We have found by using the cow peas and following with wheat and clover we are pretty sure to get good clover. I have some clover, 80 acres, \$11 an acre.

Q:—Can you raise alfalfa?

A:—They are trying that in the country and have two or three men that have sowed alfalfa and had quite a good stand. They imported some Kansas seed. In one instance I know of they scattered 100 pounds to the acre, and at the Farmers' Institute some alfalfa specimens were taken that were good. We ought to have and use alfalfa and probably will. We are now in the dairy business and buying and selling different things, and as fast as we can get at it we will.

Q:—What can you buy good land for?

A:—\$30 to \$50 an acre, and I am ready to sell you a farm whenever you want it, and I am not in the real estate business either. I don't want to get rid of what I have, for you couldn't buy it.

Mr. Hostetter:—Where did your dairy men get your cows?

A:—From everywhere. We started in to get them and they went all over the southern part of the state and bought some cows in St. Louis at the stockyards and brought them out, and bought them in the southern part of the state and in the eastern portion and some in the northern part of the county and anywhere where we can get them. Some farmers are raising their heifer calves

and I think they all ought to when from good sires and good mothers.

Q:—Do you ripen cow peas down and get the seed?

A:—As to what kind to sow? The Whippowill pea, the black kind will sometimes ripen and sometimes not. The Black-eyed pea, the Whippowill ripened very well and the Clay pea ripened some.

Q:—What was the cost per acre and what amount of fodder?

A:—Ten cents a shock for shredded fodder. I have my own shredder and you would pay 10 to 12 cents to shuck it. I think the shredding of the fodder costs as much as shucking it. As to amount per acre, I can't say just exactly, we never weighed any of it. I am not one of those farmers that a good many are—scientific—not a farmer who starts out with his lead pencil, they get poorer quicker than any one else. I never started in with a lead pencil. The way I run my farm is fairly successful and I have a little more money in the bank than when I started. I think that any man can figure his feed at so much and this and that and the other and you can figure a farmer in debt every time.

Q:—How large do you make your shock?

A:—According to the condition of the fodder, if a little green 16 or 12 inches square, if we can a little larger. We want to put it so that it will not spoil. We put the shocks a little large just so they will not spoil.

Q:—What condition must it be in to shred?

A:—Damp.

Q:—How do you cure it?

A:—It will cure itself. I don't mean take wet fodder. When a little damp it will haul 3 or 4 shocks to a load and when dry only two. It won't go through the machine as fast. If you put it in there before cured out when the sap is in it, it will rot. If the sap is out it will cure out nice.

Q:—Can you save this shredded fodder if you don't have to put a cover on it?

A:—Cover it with hay.

Q:—The barn is the best?

A:—Yes sir, you can stack it out and cover it with hay, but it would be better to put it in a shed 32x24 and let the planks come down within 6 feet of the ground and let the cattle eat it.

Q:—How about expense?

A:—I don't know, it takes about three teams to bring it in and about that to bring the other in to to the silo.

Q:—Did you pack your fodder? Never saw any that would keep good?

A:—Yes sir, just as tight as you can. Never saw any that will keep like that? If you will go to a farm tomorrow I will show it to you, some put in wet and some dry and as nice fodder as you ever saw in your life. We put two men in there and tramped as hard as we could.

Q:—What is your opinion of shredded fodder compared with Timothy hay for feeding horses or cattle?

A:—Horses and cattle are two different things, don't feed no milch cows Timothy hay. I feed her fodder and for years I have been shredding my fodder and putting in the loft and selling timothy hay \$10 a ton.

Q:—Why not sell fodder and keep timothy?

A:—I consider it cheaper and got \$10 for hay, and I could not get \$10 for the fodder.

Q:—I think you are considerable of a scientific farmer?

A:—I thank you.

Q:—Mr. Newman:—It always pleases me to introduce a gentleman and have his address come out as I said it would. I don't believe that the dairyman or the agriculturists in this state have a better friend than C. J. Lindley.

Music by Greenville Quartet.

Encored.

By the President:—We will now listen to the Assistant States Food Commissioner, Mr. Patterson, of Chicago.

Ladies and Gentlemen.

I did not expect to be here this evening. My chief, Mr. Jones was billed to speak to you, and I fully expected he would fill the engagement, but unexpectedly he was called away. He telegraphed me yesterday to come and try to fill his place at Greenville.

I enjoyed very much the address delivered by Judge Lindley. We in Chicago think a great deal of Mr. Lindley. We know that in every position that he has occupied, he was always a leader. You people of Greenville and Bond County and in this part of the state will some day see Judge Lindley in the Governor's chair, but not for four years yet. We of Chicago are going to be for him for treasurer of this state, and I am proud and pleased to know him as my friend. He is an expert and a typical farmer; that makes him sound, as the farmers in this state and every state in the Union are the foundation of this great Republic. They produce the wisdom and they had the brains to guide this great country to its present position. If it was not for the farmers, the cities would not exist, and we are under great obligations to the farmers.

I am a farmer myself; I was raised on a farm before I lived in Chicago.

Last summer there was a great agitation about the milk supply of Chicago, and the different organizations and newspapers and especially the health department in which are some very wise men, concluded that the adulteration of the milk supply of Chicago was done by the farmer, and they blamed the Illinois Food Commission for that adulteration. They said the Illinois Food Commission should see to it that the farmers did not adulterate the milk. Immediately they brought the Illinois Food Commission into the breach, and an investigation of the samples taken by the inspectors of the Illinois Food Commission of the City and especially the Chicago places, and we found that out of 245 samples taken in the country district, that 4 samples were adulterated, and out of 108 samples taken in the city that 45 were

adulterated, so we just put the blame where it belonged, namely, in the city, as far as we were concerned.

Well, that was rather a bad position for the City Health Department. The fault lay with the contractors. Then they said that the Assistant States Food Commissioner could not milk and that he didn't know anything about it, so they passed resolutions in their different organizations asking the Food Commission, and naming the Assistant Food Commissioner to go out and milk personally cows himself, and ascertain what and where the adulteration was done, Herefords, Jerseys or any other kind.

So, in looking around, I asked several of the dairymen near Chicago where it would be advisable for me to make that test, and my good friend, Mr. Gurler, and two or three others told me to go to Gurler's. I concluded Gurler's place was the proper place to make that test, and we invited all of those resolution fellows and the City Health Department to go out and see the test made. We went out and made it and I want to say to the dairymen of Illinois and to the members of this Association that I found your good President right there to see the test made, and I have found him in many places looking after your interests and seeing that the Food Commission was doing the thing properly, and therefore I think that we as citizens of this state ought to thank the President of your Association for his energy and efforts in putting the blame and conditions where they rightfully belonged, and the Dairy Association in particular owes a great deal to the officers, especially the President and Secretary for their ingenuity and energy practically without remuneration—the Secretary gets a little and the President none—to look after your interests, and I as a citizen and a farmer feel very grateful to the President of this Association.

Getting back to my original matter, we took samples and milked cows and took the milk to the laboratory, and the samples were all right and the farmers were all right, and the blame was right with the city government for not protecting the milk after it reached Chicago. We stopped all of this argument because it was not on the farm, but in the City of Chicago.

There is another man—two of them—I would like to pay a compliment to. Mr. Glover and Mr. Frazier. Glover is doing splendid work in testing the dairy herds, and we owe much to him and to his efforts. It is inspection and energy in this line of work that will make us all feel grateful to them for their efforts.

As I said before, I was notified yesterday and I dictated my address that I will read to you, with your permission tonight.

ADDRESS.

By Rudolph M. Patterson, Assistant Pure Food Commissioner.

I want to congratulate you on the interest manifested by the officers of your Association, especially your President, Joseph Newman, and your worthy Secretary, George Caven, in their great work in the interest of the dairymen of Illinois. There is not a place I visit in my official capacity in Illinois that I do not hear praises of the work fostered by the Illinois Dairymen's Association. Your work is felt all over the land as the work of the most aggressive Dairy Association in the United States.

The dairy interest of this state is marvelously great. There are about *four thousand dairies and one thousand creameries*; and *about twelve thousand grocery stores and three thousand booths in general stores* where they handle dairy products. It has been an impossibility for our department to inspect all of the creameries in Illinois on account of the small force of the inspectors; however, our next annual report will show that we have inspected *five hundred* creameries, giving a *detailed* report of the inspection. I am glad to say to the members and delegates of this Association that there has been a vast improvement in the sanitary condition of the creameries in the last two years. Of course we all know the cleaner and better sanitary conditions the creameries are kept in the better and more wholesome the product



HON. C. J. LINDLEY, Greenville, Ill.

Chairman of Local Committee of Arrangements for Convention at Greenville of Illinois Dairymen's Association.

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will be thereby greatly increasing the demand and consequently the price.

In discussing the dairy interest generally, I may start from Greenville, and go across the northern part of Indiana and the northern part of Ohio into the dairy district of the Western Reserve, then into the Empire State of New York, entering Pennsylvania, crossing her hills and beautiful dairy valleys along the rivers, Juniata, Susquehanna and Susquehanna, into the feeding grounds of Lancaster—the most picturesque dairy country in the great Keystone state; then returning through the blue grass region of Old Kentucky—the state noted for her beautiful ladies and fine stock—and coming up across the Miami Valley of Ohio, through the southern part of Indiana into the great and growing dairy districts and the broad and fertile fields of Illinois. Here we find, from Cairo to the Wisconsin line, a distance of four hundred miles, every acre of our soil contributing to the great dairy interests of the greatest dairy state in the Union.

The foundation and cornerstone of success on the farm is the dairy industry and the live stock business. Illinois has taken an advanced position in this line and today she leads all other states in dairy products—in fact she leads the entire world. She fixes the price of butter and each week makes and gives out the quotations of the butter market for the whole country. What is known as the Elgin butter district is in the state of Illinois. The production of the creamery business of this locality last year was 45,121,115 pounds of butter. The butter output here brought on the market in 1902 nearly \$11,000,000. The Elgin brand of butter is known all over the world and is considered the best by all. The price of butter in 1902 averaged higher than any year since 1893, which stimulated the production of milk and caused a great increase of creameries in our state.

The average price of butter during the last thirty-one years has been 26 2-5 cents per pound.

It may interest those who are not familiar with the business to know how the price of butter is regulated and fixed, although I presume there are many of the members here far more familiar

with the subject than I am. At Elgin, Illinois, when the butter board opens each Monday noon there are from 50 to 150 people present—men who have butter to sell and men who have come to buy, owners of creameries, representatives of commission houses, brokers acting for big wholesale houses in other cities, and those who are engaged in the export business. All butter is graded according to its quality by arbitrary rules for the protection of the trade. The proprietor of a creamery who has a quantity of butter to sell offers so many pounds, just as an operator on the board of trade offers wheat, oats or corn for sale. Other proprietors do the same and the buyers bid for it. Each bid is recorded by the secretary and the dealers keep tab in a little note book. At 2:30 o'clock p. m. the offering and bidding closes, then the secretary calls for final bids, and asks each seller if he accepts the offer that has been made by the buyer for his butter. Some of them accept the bids and some decline and a record is made of all purchases. Then the quotation committee, which consists of five members of the board, elected by their colleagues, retire to an adjoining room with a statement of the prices bid and the prices accepted and draw an average, taking into consideration all phases of the situation—the condition of the market, the cattle, the pastures, and all other circumstances—and within a few minutes report to the open board what in their judgment is a fair price, and that is the rate for the rest of the week.

The surrounding country within a radius of 75 to 100 miles from Chicago is fast becoming a great dairy country on account of the facilities to ship milk from the dairies into the city of Chicago. Now you can see train loads of twenty-five cars, with 200 cans of milk to the car, start in the morning and make the circuit around over the different railroads in the northern part of Illinois, especially in a northerly direction from Chicago. The arrivals of the milk trains at the depots are on schedule time, and the milk trains are treated with the same consideration that the passenger trains are by the railroad officials.

The largest condensed milk plant in the world is at Dixon, Illinois, where over 3,000,000 pounds of milk a day is handled.

This industry in the United States consumes over 600,000,000 pounds of milk yearly, and makes in the neighborhood of five million cases of milk of forty-eight cans each. There are more than 200 condensed milk factories in the United States. Elgin is the birth place of the condensed milk business. The process used now has never been changed since it was originally invented in 1856.

More attention should be given to the sanitary condition of the dairy and creamery industry. Scientific investigation has clearly demonstrated that typhoid fever and diphtheria and practically all contagious germs are transmitted to the human body through the agency of unclean and impure milk. And it has been proven beyond a question of doubt that deaths of bottle-fed children have occurred from diseases that have been transmitted into the milk by careless handling. Diseased germs have been known to pass from milk into the butter and there retain life for a period of four months. Fortunately the danger resulting from these germs has been greatly reduced by the modern method of separating the cream by a machine and pasteurizing it, thereby eliminating the germs and leaving the product in a comparatively pure state.

In our investigation in Illinois we seek to protect the people from the product of diseased cows, and to stop the use of filthy stables and unclean receptacles and the employment of careless men.

The introduction of modern scientific methods we believe will be the result of our inspections. We know of no better means of bringing about improved conditions than through the exposure of unclean dairies and creameries; and it is our belief that such revelations not only protect the public health, but prove of great benefit to the honest dairyman. If the dairy farmer would run his farm and dairy and manage his affairs as industriously as the merchant or banker, he would meet with equal success in his business. In this connection I desire to refer to the need of a more practical education for our country boys in the dairy farming pursuits—an education that will not only better

prepare them for agricultural pursuits, but at the same time awaken within them a greater respect for their calling. The mechanic of these times is taught manual training; the engineer surveying; the soldier military tactics; the lawyer jurisprudence; the preacher theology, and the banker bookkeeping and banking. All these are educated and equipped for their special line of endeavor. But the farmer boy is turned loose into the broad fields to work out his own salvation in the great workshop of nature, handicapped by lack or knowledge of the soil and its capabilities. It is my opinion that agricultural chemistry should be placed in the common schools in the rural districts. The farmer boy should know more about plant life and its relation to the soil, so that if any one of the elements necessary to product a crop are lacking he will be able to tell exactly what is needed and procure the necessary elements. He should understand thoroughly all questions entering into the care and treatment of the cow, such as pasturage and the things necessary to enable her to produce the best results, as well as the proper handling of the milk in its preparation for the market.

In many cases the sanitary improvements of the creameries and dairies are a mere matter of a little work without any financial outlay.

It is my belief that legislation in the interest of the dairy and creamery industry of this state should at all times receive paramount attention by the people.

Indisputable statistics show Illinois to be at the head of the dairy industries of the world. She waits for no country, no city—not even New York City, London, Liverpool, nor any other city in the world—to set the mark, but leads all herself. For Elgin and our own glorious state makes the market price for all countries every day of the year excepting Sundays. At Philadelphia, Paris, Chicago, Buffalo, Charleston—in fact whenever and wherever a world's fair or great exposition is held, there will always be found Illinois with all of the blue ribbons attached to her dairy exhibits.

And with our present dairy laws as rigidly enforced as they are now these results bid most fair to attain always.

And why is it so?

Because our grand state affords the opportunities so well grasped by the farmer and the dairy producer.

Because our dairy farmer has the knowledge of making these results.

And because in Governor Yates we have an honest, aggressive executive who has fostered the dairies of the farmers for the betterment of their products and firmly and fearlessly caused all laws pertaining to the health and welfare of our people regarding pure food and dairy products to be rigidly enforced by the State Food Commission in all of its branches.

DISCUSSION.

Mr. Gurler:—Who is it that is butter expert on creameries—has the practical charge of Illinois?

A:—Mr. Hoy

Q:—The man who has a practical understanding of butter-making?

A:—Mr. Hoy.

Q:—Does he have police powers?

A:—Yes sir. The law gives him the right to close any creamery that is not conducted properly and kept in a sanitary condition.

Q:—What about the dairies?

A:—There is nothing upon them. The law don't cover them. We inspect the dairies when we are out, but the law does not go far enough to cover these questions. You will have to look to Judge Lindley or some of them to amend the law in some of these respects.

Q:—Have you a record of the value of dairy products for the last year, or the year before. I mean cheese and milk?

A:—The one I have here is 1902.

Q:—What was that?

A:—1902 the value of butter eleven millions. No, I didn't get that; this is only in Elgin.

Mr. Lindley:—In your paper you said three million pounds of milk a day?

A:—I meant a year.

Q:—We are trying to beat that, and I began to think we couldn't.

Mr. Gurler:—Can you furnish on application the location of creameries in Illinois?

Q:—Have you a pamphlet?

A:—Yes sir; in our next annual report. On the inspection of creameries and dairies; it is about as hard an undertaking as can be. You go to the county seat and ask any of the officers there if you could get any information, and maybe he will tell you of seven or eight creameries. You have got to cover the road all over to reach the dairies and creameries. There is no way you can get them unless you go out into the field. In some states they have all of them practically.

Q:—How many creameries in the state?

A:—I presume possible 1000. There may be more, and about 4000 dairies. That is a rough estimate, however.

Q:—How about cheese factories?

A:—I can't give you any information.

Q:—Don't you inspect them?

A:—No, we have not. There are not many cheese factories in Illinois.

Q:—What do you mean by dairy?

A:—The dairy is where the milk is produced.

Q:—You mean individual dairies or where the farmer ships milk?

A:—I don't mean a farmer, a farmer is not a dairyman.

By the President:—Tomorrow we will have a very interesting subject. Mr. Lee will continue this subject on creameries.

We don't want you to forget the membership committee. The men in the audience are willing to make you a member of the Association. This not only entitles you to last year's report

but this report will be out inside of 90 days if we have good luck.

The butter room will be open tomorrow afternoon for your inspection. It is the room just back of this room on this same floor. We have a very good display considering it is down in this section. If it was in the north we would probably have 100 entries, but being here, it is very good.

We will close this evening's exercises with a song by the quartet.

Encored.

WEDNESDAY MORNING SESSION

Convention called to order by President.

We will commence the exercises.

Let the Committee on Memberships keep busy. We want as many members from this section of the state as possible. They not only get this year's report, but also the book printed last year which they can have for the asking.

The Committee on Memberships will circulate amongst you and we hope you won't be bashful about handing over your \$1.00 to Mr. Spies, Mr. Shearer, for they won't be bashful about taking them.

I will appoint the Committee on Nominations:

E. Sudendorf, Clinton, Illinois.

W. R. Kimsey, Tamaroa, Illinois.

F. N. Wiggins, Springfield, Illinois.

A. J. Shearer, Aurora, Illinois.

J. A. Latzer, Greenville, Illinois.

I want the election of officers to take place when all the dairymen are present. I want them to feel that they have a hand in it. Of course it is only members that can vote in this matter.

I would like every dairyman that milks a cow to get his membership this morning so he can vote this afternoon.

The other Committee I will appoint later.

By Mr. Kimsey:—I propose that Mr. Sudendorf appoint a place and time to meet.

Mr. Sudendorf:—Immediately after this meeting at the hotel or one of these rooms.

By the President:—The Committee on nominations to meet at the Hotel Thomas immediately after this meeting.

The first paper on our program this morning is a very important one, "The Types of Dairy Cows." This will be given by Mr. L. A. Spies of St. Jacobs. He is one of the men who has done the most on this subject in his part of Illinois.

TYPES OF DAIRY COWS.

By L. A. Spies, St. Jacobs, Ill.

Ladies and Gentlemen.

I wonder if I can make room for my cows up here (exhibits charts).

This is getting to be an age of specialization. We are supposed to specialize in whatever we undertake, that is, if we want to reach the maximum of success.

It is the same in dairying. It is the same in the beef line. It is the way in which the race horse of today has been developed until they have gotten down below two minutes with the record of the trotting horse—a matter we considered impossible. It is the same way in the dairy cow. We have developed a dairy cow that is capable of producing five times more than the ordinary cow that we had some years ago, that is I mean the average cow.

We will say, for instance, that out here in the square there is going to be a pulling match. What kind of a horse would you

go out there with? With a draft horse or with a race horse? Of course, to draw a load requires an animal that is bred for that purpose. An animal that has the muscular development, the weight and that peculiar temperament that is required of that animal. If there was to be a race out here on the same track, what kind of a horse would you take to enter in that race? Would you go out there with a draft horse or with a race horse? A race horse of course. And you would not want any draft blood in that animal.

This (pointing to chart) represents the draft animal that is the dairy cow of the beef type. I wish to separate these cattle into two classes, the dairy type and the beef type. They are distinctive as the race horse and the draft horse.

You will notice that this animal is of the beef type. It has, for instance, a breadth between the eyes and short from there to this point. It has a short neck and the further back the wider. You will find it is short legged, built close to the ground. Now this principle not only holds good in beef animals but it holds good in the draft horse; it holds good in the best developed porker that we have today. You find that there is no place left here between the hind quarters for an udder. It would be impossible to place an udder of any size with this beef animal. If you are in the beef business this is the kind of an animal you want, that is, one of this type.

You will notice in this cow (indicating chart) that the distance is greater from the muzzle to the point between the eyes. You will notice that she has got a slender neck; that she has barely meat enough on her back to cover her bones decently. That is the dairy type. You will find the development here. The thigh is thin and slender, leaving room for a good sized udder which is always necessary in a good dairy cow; you must have an udder.

You will also find that the milk veins are well developed, and here is a principle that holds good in all dairy animals, you must have the catham, the reverse of what you must have with the beef animal.

Now we sometimes hear a man say "I have got Short Horns." That is rather an ambiguous term, what type of Short Horns has he? You have got the beef type or the dairy type. This is the beef type and the beef type is wrong if you are in the dairy business, because you see the same rule holds good. The animal's body is virtually a parallelogram. The object of this animal is to put the most meat for it sells for the highest price, and that is the back and hind quarters, and the more room there is and the more meat that goes there, the more value the animal is.

Now a very good illustration of this fact was developed up here at Ames, Iowa. They took a Jersey steer and a Herford steer. One represented the dairy type, the other represented the beef type. They fed those two animals about the same amount of feed for a period of nine months. At the end of that time they took them to market and when they came to market them they found the Jersey brought two and one-eighth dollars below the market price and the Herford ten cents above the market, making a difference of over \$2.22 between the two animals. The net weight of the Hereford was 67½ per cent beef and the Jersey 57 per cent. In the Jersey there was two times as much tallow. These animals had gained virtually the same amount on the same amount of food and from the casual observer you would have said one produced just as much meat as the other, but when they came to dress these cattle they found the difference to be greater than they had supposed on account of the Jersey having produced so much more tallow. The tallow was worth 4 cents a pound and he had very little of the choice cuts; hardly enough beef to cover his back decently. This was worth 18 cents a pound, and there was not much of it. The market returns was 49 per cent greater for the Hereford than for the Jersey. I venture to say that if you would apply the same rules and take a beef type and a dairy type you would find that the difference would be just as great in favor of the dairy type in the dairy test. This teaches us that we ought to try and keep the right kind of cows, that is, a man don't necessarily have to be a lover of one kind of animals, one breed

of animals, but he should choose the kind that he likes and that is suitable for his business and go ahead, but he must not select a beef type and expect to go into the dairy business.

Here is another Short Horn. That illustrates the difference between two kinds of dairy cows. This cow here was the Durham cow that gave the great results at the **Columbian Exposition**. A Durham cow there that made a much greater return than the rest of the Durham cows and this is a good likeness of her. Here you see development of the milk veins, you see the catham, and this should teach us that we must not go by the names of things, but use our own judgment when we come to make a selection. We must bear in mind the type, or, in other words, we must aim for that type.

I need not tell you that this Jersey is a dairy type; she is a good one. One of the World's Fair cows. Look at that catham and the wonderful development of the udder and milk veins all convince one of the kind of animal. If a man wants Jerseys, he can get them, but get the best. If he wants Holsteins, get the best. If he wants Durhams, get the best. If he wants Guernseys or any of the breeds, let him get the best. That's what my experience has been, and I never believe in being prejudiced in anything or try to make one man believe that there is only one breed of cattle. That is a matter that must be decided by the owner, and our likes and dislikes go a great ways in determining what kind of success we have.

Now, after determining what kind of cattle you are going to keep, but in the first place it is necessary to determine what business you are going to go into; the second, decide what kind of stock, what breed of cattle you are going to keep, and when you have come to make your selection, select the very best.

My experience has been that the only way for me to develop a first class herd was to breed it. Don't be too close with yourself while you are making your selection for your foundation stock, look up the records and then go ahead and perfect a herd of animals, a herd of first class animals, first class dairy cows from your own breeding up. Go and take the results that have

been carried on for hundreds of years, and commence to build where the other man has left off. If you buy a dairy cow that some one else has bred, you buy all the mistakes that the other man has made, and the dairymen here know there are many mistakes that are made, and the man that buys them will find it out to his sorrow later on. Where it is possible, the foundation stock should be of some pure dairy breed for the dairy business. The reason is this: That if you get pure breed you know what results you will get. I could tell just as well when I made two pure breeds what I was going to get as if I bought yellow corn I know I would get yellow corn. The reason was just simply this: Experience had taught me that from generation to generation these animals had been developed for the one purpose, and the result was that you would get that kind of an animal, and you don't make the mistakes that you did if you are going to select and try to mix up everything.

If you do mix the different breeds and try to take a mongrel and breed it you will still find there are lots of crosses and mistakes. You will not be the gainer but the loser.

I believe that discussion very frequently brings out more than any one can say, and if any one wishes to ask any questions I will try and answer them.

DISCUSSION.

Mr. Glover. Q:—Did you take into consideration the depth and length of the animal?

A:—O yes, but I did not want to take up all day. That is important to a great extent, it gives the digestion. Of course the machinery has got to be there. A dairy cow is virtually a machine. You have got to have a machine of proper size to do proper work.

Now you notice these pictures are made from photographs and the artist that did them lived miles away and I did not tell him to put on any touches. Did you notice the length of that animal, it speaks for itself.

I might mention right here, that if I was going to teach agriculture in the public schools, I would try and get the state to make charts and hang them on the walls of the school houses. Have the different types of the best animals and what they are good for, and the children would set in their school room and the type of that animal would be fixed in that child's mind that whenever the teacher would ask what type of an animal that was and what it was good for, and how it was produced and so on, that it would be an object lesson. For instance these steers, the Hereford and the Jersey steer. The Jersey steer had put it in this part here. He had tried to put it into the pail where his mother had been putting the butter fat for generations. Not on the back but down here, and that is the reason there was such a difference. You need the length of the animal, so that the animal can digest properly. These object lessons are supposed, to a great extent, to appeal to the mind of the listener, and that is the reason I did not talk long on that same point.

For instance, the cow should be much wider through the rear than in front. She should be wedge shaped. And there are a great many other points that were not touched upon.

Any other questions?

Q:—In your experience of talking before farmers were you ever convinced there could be produced steers from dairy animals?

A:—I did find a gentleman last summer at a dairy meeting and he had gotten a Hereford male and he thought that was just the thing to improve the dairy stock, and after he had heard me talk and he come and shook hands with me and said "You opened my eyes, it was a false god, it was proper to smash it. I have been using a Hereford and I know I am wrong." I believe this is so plain that common sense will hardly ever question it.

Q:—Have you heard them question the theory of the beef animal. The old dual purpose cow?

A:—Not so much of that down here. I was a dual purpose animal man once myself, but I have learned better.

Q:—You better come and talk in our part of the state.

A:—In Iowa that illustration between the two Durhams appeals to them so strong that they won't question it because I find in Iowa they have lots of corn and a pretty good class of Durhams and the people up there I find milk a kind of a dual purpose animal, but it costs 20 to 40 to 100 more to care for that kind of animals than a special purpose animal.

Q:—It requires more skill to feed a dual purpose animal than a special cow?

A:—Yes sir.

Q:—To keep her producing properly?

A:—Yes sir. It is just the same as taking a race horse; it takes more skill to get the best out of a race horse; lots of people like a good race horse and I am not saying anything against a good horse. It takes a skilled driver to develop a first class race horse to get the best speed, and it is the same with the cow. You get a first-class animal, her capacities are so great if you treat her right. It is like the man who is running his automobile at 75 miles an hour, he is liable to have a wreck; he has got to be very careful.

Q:—What's the average amount of milk given by a cow through the state of Illinois?

A:—A little over 3,000 pounds.

Q:—What would you consider the paying quantity?

A:—All you can get. A paying quantity I should say ought to be 7, 8, 10, 12 and if you can get 15 or 20—all you can get. We are just now trying to develop the dairy cow the same as we started to develop the trotting horse forty years ago.

Q:—What do you mean, you said it was five times as large as it used to be, and now you say 3,000 average today.

A:—That is the average I understand.

By the President:—That was in the census of 1900.

A:—When we talk of average we want to understand that is what we have got. I remember of reading a couple of years ago of a saying that if the dairymen would wake up and find one-third of the cows dead—the poorest one-third—that the dairymen would be better off, and I believe that is so. We are work-

ing too many averages. There is too much room on the top. Get as much as you can.

A member. Q:—You have not touched on the feed at all. What is the best ration for that style of cow in this locality?

A:—If I was going to try and produce good milk here I would feed bran about 10 pounds a day. I would feed about 2 pounds cotton seed meal a day. I would feed about 10 pounds of clover hay or cow pea hay, and what other feeds that I had in proportion, but ensilage and clover or cow pea hay with bran and cotton seed meal make a very good ration.

Q:—No corn in it at all?

A:—Corn, yes, if you have it. Lots of farmers of this country don't produce enough corn. He ought to, as far as possible, feed what he raises.

By the President:—This is turning into our subject of this afternoon, and it will come out then in the feed of the animal, and as our time is getting short this morning we will have to pass on. Remember those questions this afternoon.

If any one here would drop a card to the United States Department of Agriculture he can get the statistics for this cow, under the heads of the breeds of dairy cattle. The government gives out a pamphlet.

By the President:—You have perfect liberty to write to Champaign and free to have the bulletins that are issued to be sent to you by mail. You pay your taxes and that is what you pay them for. It is your state, it doesn't belong to people outside of this state. Drop a card to Prof. Davenport or Prof. Fraser or Washington to the Department of Agriculture.

Is Mr. B. C. Settles of Palmyra, Mo., here? He was to talk on the building up of a profitable dairy herd..

We will pass on to the next paper.

By the President:—The next on the program is "My Dairy Herd and What I Have Accomplished" by J. N. Wiggins of

Springfield, Illinois. He is a young man who has given considerable attention to the subject and we will be pleased to hear what he has to tell us.

MY DAIRY HERD AND WHAT I HAVE ACCOMPLISHED.

By L. N. Wiggins, Springfield, Ill.

The subject assigned me sounds pretty big. You will have to pardon me if I deviate from it somewhat, because I have accomplished very little.

It might interest you to hear something about our hotel farm. The Leland hotel farm has been run in connection with the Leland hotel, of Springfield, Ill., for almost twenty-eight years. It has furnished the hotel with all its milk and cream and a great part of the butter, veal, sausage pork, spring lamb, garden truck, etc. The farm is located three miles from the hotel and about one mile southwest from the city limits. It consists of 240 acres.

Particular attention has been given to the development of the dairy interests. Our herd of cows is made up of pure bred Red Polls, grades of Red Polls, Short Horns, Holsteins and Jerseys. We have been careful in mating and selecting healthy animals with dairy qualities. A little more than two years ago it became my especial duty to manage the farm and at the same time continue my duties as steward of the hotel. The farm had been very well equipped and was a source of great pleasure and pride to my father, and at the same time had paid quite well. I realized I would have to exert every energy in order to conduct the business as it had been conducted; and at the same time make it pay well. You must pardon me for speaking so much in the first person, but I am supposed to emphasize the fact that great help can be derived from exhaustive study of our good dairy and farm literature.

It took me about three months by reading at night when opportunity afforded to study the greater part of "Feeds and Feeding" which my cousin had recommended to me as being a very good book. To start with I borrowed a copy of him. "The Breeder's Gazette" and "Hoard's Dairymen" have been coming to me, ever since I started that book. I soon found that the forty cows we were milking, did not yield enough returns, when compared with reports of other herds, and my interest was aroused.

We had milked in the old fashioned way. All the farm hands, good and bad milkers, started at one end of a row of cows and milked the cows just as they came to them until that row was finished; and then on to the next row. When I wanted to know what a particular cow was yielding I had hard work to find out and then could not get accurate information, so I gave each man certain cows to milk. The milk yield increased at once.

By the 1st of March, 1902, I had all the cows numbered and had found an old four bottle Babcock tester. We saved composite tests for a week. From Mr. H. B. Gurler's "American Dairying," I had gathered some information on testing milk and so went at it with a great deal of awe and against big odds. The foreman of the farm, who had been employed by my father for a great many years and five other old employes could not stand the idea of weighing and testing milk, only two of the farm crew of eight stood by me.

During the March, 1902, the forty cows which were in all stages of lactation, most of them fresh in the early fall and winter, averaged: 459.4 pounds of milk, average test 4.2 per cent, average pounds butter fat 19 pounds. Figuring as Mr. Gurler had recommended I estimated that the average yearly record for the herd, or 8.4 months would be about 3,459 pounds of milk, 159 pounds of fat, and increasing by $\frac{1}{8}$ they would yield 179 pounds of butter.

Our feed was costing us about 23 cents a day for each cow. The forty cows were averaging about two gallons of milk per day. You see our milk was costing us, to produce it, about 11 cents per gallon, besides the cost of labor which amounted to about

7 cents per cow per day. Our eyes were being opened. We bought two young registered Red Poll bulls from predominant milk and butter strains, the very best individuals we could buy, regardless of price. We sold sixteen cows and heifers the first year. A good many heifers came in fresh and we started by buying any first class cow we could find. By careful study of the individual records of the cows and weighing the feed to the individuals four times a month we were able to keep close track of and to cut expenses and steadily increase the milk production.

I had studied out nutritive rations and found our ration had been about one to nine (1:9). We gradually brought it to 1:5.8. We have had best results from a 1:6 ratio, varied according to the price of feed and working conditions of the cows.

Last March, one year from the time we started to weigh and test, we milked forty-nine cows, the average pounds of milk produced for the month of March, '03, was 740.3 pounds, an increase over March, '02, of 280.9 pounds per cow.

The average test was 4.04 per cent, 16 per cent lower than the year before, but the average pounds butter fat produced was 252 pounds, or about 283 pounds of butter.

In short we had increased the milk production from 3,459 pounds per cow to 6,219 pounds, or an increase of 2,756 pounds per cow. The butter fat increased from 159 pounds to 252 pounds, an increase of 93 pounds per cow, and instead of forty cows producing an average 179 pounds of butter we had forty-nine cows which averaged 283 pounds of butter, an increase of 104 pounds allowing $\frac{1}{8}$ for overrun in churning.

Our feed for March, 1903, cost us on an average of 19 cents per day per cow, with a ratio 1:5.9. Several cents higher than it had been in the early winter months. The average cost of production for one gallon of milk for the year, March, '02, to March, '03, was eight cents, under modern sanitary conditions. Of course the calf, the manure (which is carefully saved) and skimmed milk are expected to, and do pay for the attendance of the cow, which amounts with us to about 5 cents per day.

Our cows were tested each month the first year; composite samples being taken from six consecutive milkings. Since last March, '03, we have tested them every month, but the weighing at each milking has been, and will be kept up. Thirty-four cows completed the first year with an average of 5,755.8 pounds of milk and 284 pounds of butter, average income was \$77.84, average cost of keep \$49, average net profit on butter basis \$28.84. Five heifers, with first calf, yielded 4,213 pounds of milk and 177 pounds of butter.

The year of 1903 would have seen us still further ahead in milk and butter production with larger net profits, if it had not been for a very disastrous fire last August, which completely destroyed our barns. We have just finished building a fine, modern barn, which has stalls for 100 cows, besides box stalls, engine room, silo, hospital, and feed rooms. We can drive into the second story where are located our grain bins, cutters, grinders, etc. Our hay mow will hold about three hundred tons of hay and straw, besides farm implements.

The hotel pays the farm 17½ cents a gallon for four per cent milk, 70 cents per gallon for 20 per cent cream, 5 cents per gallon for skimmed milk, and Elgin prices for butter.

We raise most of our own veal. Starting the calves on whole milk and gradually getting them onto skimmed milk by about the second week, a grain mixture of seventy-five per cent, by weight, of corn meal, 10 per cent bran, 10 per cent oats, 5 per cent oil meal, is kept before them until they are ready to butcher. I gave them the oats, bran, and oil meal to keep them on feed. They are confined in box stalls with plenty of sun light, have free access to fresh water and salt. They dress out a first-rate quality and 55 to 65 per cent at the age of eight to nine weeks. Our heifer calves which we wish to keep are allowed to run out; and are given a growing grain ration and second crop clover when not on grass. They have skimmed milk for six to eight months.

We keep twenty brood sows, Berkshire and Poland cross, use pure bred Berkshire boars. The sows, with pigs, are started

on shipstuff, made into thin slop, and by the time the pigs are three weeks old we commence to give them a little hotel slop with skimmed milk. Our slops are brought to the farm early every morning and fed while sweet, in two feeds each day. The quantity depends upon the size and age of the pigs, as well as upon the kind and quality of the slop. These slops must not contain chicken, or poultry entrils, coffee grounds, dish water, boiled bones, or fish bones. Any of these things will sooner or later prove fatal to swine. They contain the ordinary table refuse except the bread scraps which are saved and fed to the sheep and chickens. The vegetable parrings are saved separate and fed to the sheep. You see we do not have to feed our sheep grain. With skimmed milk, shipstuff, and the lighter slops we start our pigs and fatten them with corn and slops.

We are now making into sausage meat for hotel use, last March pigs which weigh from 280 to 370 pounds, and they are dressing out about 82 per cent. They have had slops and corn as concentrates since they were eight weeks old. A good clean sweet hotel slop is without doubt an excellent supplement to corn but must be fed with good judgment for profitable results. Our hogs pay us a very handsome profit.

We supply the hotel with summer vegetables and raise enough turnips, beets, etc., for winter use. We grow enough potatoes for early summer and fall use. Our rich black soil does not produce a profitable winter potato.

I sincerely hope that every dairyman here, be he old or young, is keeping individual records of his cows. Our case is a good example. For twenty-eight years we thought that we had a very profitable herd of cows and we did, but they were not sufficiently developed. It takes the scales and tester and a whole lot of plain digging and individual close attention to produce milk and grow healthy animals. We are only just getting started. But now we are milking eighty cows and during December, '03, we averaged $2\frac{1}{2}$ gallons of milk per cow, with an average test of 43 per cent butter fat, and the cows had no shelter. They are now in the new, comfortable, modern barn, and next year we

hope to average 7,000 pounds of milk to cow and 300 pounds butter fat. At present we are selling 40 to 50 gallons of milk daily at wholesale. We standardize it to 4 per cent and get 17½ cents a gallon for it.

DISCUSSION.

Q:—Did you change your breed of cows to get the increase?

A:—No sir it was right there.

Q:—You sold or got rid of some of them?

A:—We sold 16 out of the 40 the first year.

Q:—What was your best cattle?

A:—We had better success with—that is our best cow was a cross Short Horn and Jersey. We had 6 Red Poll first cross and Short Horn and Jersey cows and the first cross was Red Poll.

Q:—Haven't you found your milk records created a good deal of misunderstanding?

A:—Yes sir. After we got started it was all right. Of course we have to employ all of our help.

Q:—How large a grain ration did you feed?

A:—We fed ensilage last winter.

Q:—How large a grain ration?

A:—We feed according to the capacity of the cow, according to the work and condition she was in.

Q:—The average of the dairy, how does it run?

A:—10 to 12 pounds, a little better than that.

Q:—What kind of feed?

A:—Equal parts of bran, hominy feed, we get it right there, corn cob meal 2 pounds oil meal to a cow a day.

Q:—Feed clover hay any?

A:—Yes sir.

Mr. Cobb.—You are feeding too much grain.

A:—We are getting results.

Q:—Do you know whether you could get same results without the grain?

A:—I thought I could when I started.

Q:—I think you are feeding too much grain.

A:—How would I get the results? I visited Hoard's barn last winter and he was feeding hardly any grain. I thought I would take five cows and try it, and I did, but I lost the cows for the year. Tried them for six weeks and they got down so bad I never got them back. I cut them down gradually half. I tried to feed every cow what she could clean up.

Q:—How did you feed?

A:—We give them clover hay mornings, then ensilage, then grain, then ensilage after milking. When they can run out oat straw is before them. In the evening corn and get the grain in the afternoon got clover hay and more grain and then ensilage. Try to stuff them full.

Q:—What I want to know is, how much dry matter does each cow get each day?

A:—I paid attention to it, but I can't tell you exactly.

Q:—Just the total?

A:—I don't know.

Q:—What I was trying to get at was, you are feeding a total of too much dry matter and too much dry matter in your concentrated food.

A:—Is that so. How do you get around it?

Q:—By feeding more of the farm produce crop.

Mr. Mason:—When you feed the grain you have been you keep up the flow and when you reduce it you go down?

A:—Yes, you got to keep up the flow. You can't feed any two cows alike, at least I can't.

Mr. Newman:—Do you feed alfalfa?

A:—I paid \$8.00 for second crop of clover hay and I would rather pay \$2.00 more for that than the first crop.

Q:—Do you have different breeds?

A:—Six Guernseys.

Q:—He spoke about the hogs—when you commenced feeding corn did you feed on the floor?

A:—Yes sir, We fed our corn on some of the brickbats and dug a low place in the lot where we fed and then all the floors are

brick floors to feed on. Brickbats and crushed in center and it is easily kept clean. We use charcoal in our boilers and then the charcoal burns and leaves some fine dust. Then we take out this dust and just take that out and put a little in boxes in different hog's floors with a little salt in it and it is a great thing to keep them in condition. We find slops a very profitable feed if one can get it right. Of course we control our own slops at the hotel and can keep the glass and broken dishes out. If a man can get that and feed it with skim milk and a little corn they can make very nice profits on his hogs.

Q:—My experience about the floors is best to feed hogs in?

A:—Yes sir.

Q:—You are feeding your cows the same in 1903 as 1902?

A:—We didn't know; we just feed some bran and shipped stuff and hominy and fed what they would clean up.

Q:—You count that increase partly due to weeding out a lot of poor cows?

A:—Yes sir, weeding out and more careful mixing of the feeds. The weeding out and being careful in replacing those cows with the best cows we could find put up that increase. Just the scales and test got us started on it.

AMONG THE CREAMERIES OF ILLINOIS.

My Mr. Carl E. Lee, Elgin, Ill.

By the President:—Mr. Lee is a young man whom our experimental station fellows found up in Iowa. We don't care where they come from so we go to other States and get some of their good men.

Ladies and Gentlemen:

I am glad to be here this morning. I am somewhat a stranger to the Illinois people. I came over to this state in Sep-

tember. I have been with the boys in Iowa and seen a little in North Dakota and Minnesota, but the men in Illinois are as good as at any other place.

In some of the creameries in Northern Illinois the boys say to me, "You are here in the factory this morning, but don't say anything about the factory to any one else." The boys probably gave their reasons for saying this and I try to be good to them.

In my address this morning I shall not mention any names that will interfere with any of the work that the boys are doing. I find all classes of them, and some of the boys in this state are as fine as those in Iowa.

I was talking with a man, whose name and creamery I shall not mention, but where there was trouble testing the milk when I went there. I found there was a little difference in the reading of the test. The man who run the creamery remarked that I did not read the bottles right, so we got into an argument. He said, "You are reading like Babcock did, and I told him he didn't read them right." Now, of course, you run across those kind of boys, but they are good fellows just the same. I am convinced that all of you have one grand motive, that is the education of our buttermakers and creamery men. All of you will agree with me that there is not another profession where the finished product of a single individual comes in contact with so many people as the finished product from the hands of the buttermaker. Since it is one of the necessary things in every home, it is essential that it should be made in just as neat a room and with just as clean apparatus as the housekeeper would use in making bread.

If every pound of butter made in the creameries of Illinois was as good as could be made, it would not be long before Illinois butter would be at a premium and we could not make enough to supply the demand. I don't know how it is with you, but when I get poor butter I spread it on the bread thin. When it is good the bread is the part that is thin.

We want to make better butter than we are, and in order to do this we must make it in cleaner creameries. The milk must be brought to factories in better and cleaner cans; the farmers must take better care of their cows and barns. The creamery operator's way of handling the milk, the finished product, and the appearance of his factory are inseparable with the farmers' way of handling the milk, or the cans. The influence of the one cannot help but act upon the other.

In nine cases out of every ten the buttermaker's influence is the stronger and has the greater effect. It is important that the buttermaker should be fond of his profession in order that he may develop the most and best that is in him.

I believe that a buttermaker may engage in the profession of, buttermaking or as a creamery manager and though the work is not pleasing to him he may bring honor to himself, but not in so great a degree as if he really loves his work.

We want the men in the factories, whatever work they may have, to be honest; to have the same spirit as the poor, colored boy at a slave sale in the South. When placed upon the block he was asked by a friend, "Sam, will you be honest if I buy you?" With a look that beggared description the poor colored boy made reply, "I will be honest Massa whether you buy me or not." Friends, we are in need of just such men.

Only a short time ago, after I had made a test of all the patrons' milk, in looking over the list there was one patron whose milk tested 5.20 and there were several whose milk tested only 3.00. The buttermaker seemed to think that the milk which tested 5.20 should be reduced a little and added the difference to the 3 per cent milk. I do not know if that kind of work is practiced by very many of our buttermakers. I hope they are few, because there is not another thing in the running of a creamery that will cause so much trouble as the manipulation of the test. In this work of a systematic visitation of the creameries in northern Illinois, in order to help the creamery operator and manager, we offer suggestions for improvement when needed and compare their way of doing the work with other ways. When pos-

sible, the creamery is visited in the morning so as to be there when the milk arrives. The milk is examined and when needed, suggestions are given the patrons about taking care of their cans; how to wash them and when to wash them; also talk about the care of the milk, and emphasize the importance of bringing the milk to the creamery, well ventilated, clean, sweet and free from any odor.

One of the faults most prominent at this season of the year in hand separator cream is that it is so apt to be tainted with odors from the kitchen. One of the things that every creamery operator should be careful in and which needs looking after, is the receiving room and platform. I have had farmers say to me, "You better talk to the buttermaker about cleaning this room rather than say anything to us about our cans."

Another thing I have noticed is that a number of creameries are not careful enough with their composite milk samples. A sample of the milk is not taken every morning; the jars containing the milk are not properly taken care of; they are at times left uncovered, and at a few of the creameries a sample of the milk is taken every morning and the morning before they are to be tested the bottles are all emptied and cleaned and on the following day a sample is taken of every patron's milk and tested. What that sample tests, is recorded and stands as a test of the total number of pounds of milk the patron has delivered at the creamery for fifteen days. Work of this kind ought not to be tolerated.

Another thing that needs looking after and even the most accurate cannot be too careful with, is to see that the composite samples are thoroughly mixed, all of the cream dissolved and removed from the inside of the bottle before the pipette is filled.

At this time it might be well to say a few words about the test. A number of the farmers have complained to me that their milk is not tested right. In a number of cases the farmer is not to be blamed for complaining because he is not given what his milk really tests, especially if he has a good test, and lives where he cannot take his milk to some other creamery. His

test is lowered and the test of some other patron increased in order that he may not leave because he has brought milk to the creamery rather low in butterfat. The buttermakers that do this kind of work are doing an irreparable loss to the dairy and creamery industry of our state. What need is there for the state to try to get the farmers to improve their herds, when creamery men are doing that kind of work? And another thing, when the farmers who have improved their herds find out that they are not getting what belongs to them by right, they will sooner or later buy a hand separator. The creameries object to this, but they are bringing it upon themselves. Rather than let the buttermakers increase the test by unfair means he should go to the farmer, post him on feeds and breeds, and if necessary, go to the farm and test every individual in the herd and help him to weed out the unproductive ones. Remember this is not done in a day.

As a rule the separators were in good condition. A few of them were not set so as to get the best results. For example, one separator did not skim close. The fault was not with the machine, but it was found that the lower edge of the cream screw was just even with the top of the cream pan.

Churns may be classified "very good" to "poor." It seems that a number of buttermakers have trouble in keeping the churns sweet, more so with the combine churn than with the ordinary box churn. A simple and good way to wash a combine churn is to put in quite a little water at a temperature nearly 200, run the churn on fast gear for about three minutes, stop the churn and let the water out, then give it a second washing same as the first one. After the water is let out pull the drain plug and leave churns with covers up and open. Never rinse a churn with cold water.

Wish we could find more buttermakers using starters in connection with the ripening of the cream. If the commercial starter is not used a good one can be made by selecting milk either whole or skimmed; and I say this to the boys who are us-

ing buttermilk for starter, "Do not do it, unless it should be for a single day."

During the winter months when milk is delivered at the creamery only three times a week it is a hard matter to make a good starter. The following method works very satisfactorily:

Select the skim milk; pasteurize it by setting the cans into a tank of water into which a steam pipe is extended. Heat the water high enough to bring the milk up to 175 or 180. Leave it stand at that temperature for at least twenty minutes. During pasteurization the milk should be stirred occasionally. Then cool the milk to 60 or below. Take out enough of the milk so as to carry the starter over until the following day. On that day add a portion of the starter to the milk that was held over from the preceding day, warmed up to a desired temperature.

Every creamery operator should be very careful and try to keep the creamery neat at all times, not only the things that are inside the factory but the surroundings. See that the skim milk tank is washed clean every day. Be ready for the farmers every morning.

If the farmers are not all satisfied with what you are doing for them, ask the unsatisfied ones to your creamery, show them what you are doing, try to make them understand that the work is fair and square.

To the creamery men that can see the hand separators in the near future I have this to say, "Try to keep your patrons satisfied; give each one what belongs to him; never run unnecessary water into the skim milk; see that it is run through clean pipes and delivered from a sweet tank." I believe the time is coming when the commission men will ask if the butter is made in whole milk or hand separator factories. It is our object to assist the creamery operators of the state. Anything we can do which we believe can possibly be of any help to them we are going to do to the best of our ability. Not alone because we like to do it, but because it is your right to demand it.

There is nothing that does me more good than to get a letter from one of our creamery operators stating that he would

like to have me call at his creamery. I know when I get to that creamery there is a warm hand for me and furthermore, that that man is not afraid to show me through every room in the building, and that he is not afraid to open up his milk pump or pipes to see if they are properly taken care of, or to have his churn examined.

We can talk over creamery problems and suggestions offered will be considered.

DISCUSSION.

Q:—Is there any way in which the butter can be controlled before it gets into the hand of the consumer.

A:—Not that I know of.

Mr. Hostetter:—The last two or three years I have made it my personal interest to question somewhat into the tricks of the dairy goods men after getting into the hands of the dealer. We are trying to have the milk right and the inspectors of the creameries are trying to have the creameries right. One other feature, the dairy men ought to take and consider. I am convinced that a large amount of good butter is injured in the hands of the dealer. To give an example, I have been buying Elgin creamery of a good brand of a dealer. It is excellent butter. I got a sample that got rancid. The next time I went to the dealer for butter I asked if he had any fresh butter and he said he had. I said I would like to taste it, and it had a bad odor. I told him it wasn't fresh and he said he got it last week and put it in the refrigerator. I asked to see the refrigerator and in that ice box was five or six chickens. He had dressed the chickens the evening before and put them in the ice box and the flavor of the chickens had got into the butter. They don't mean to injure the butter. I visited several grocery stores and found the same thing, everything that would spoil was put in the ice box with the butter, and those things would spoil the best butter made in 24 hours. One man used the same paddle to serve his rancid butter, good butter, grease, renovated butter, cheese and creamery butter. I think as dairymen we ought to follow up our product

and see that it has the proper care and attention until it reaches the consumer. One way of obviating this difficulty would be if each package was done in paraffin paper. The best butter I can get now comes in that way, and it is less liable to be contaminated as if done up the other way. We ought to see it is not injured and practically contaminated with bacteria that will spoil its flavor in the hands of the dealer.

Mr. Pethybridge:—What is the difference between hand separator cream and whole milk cream. What is the difference it would make if the butter was made from gathered separator cream or whether from whole milk at the creamery, if it was of equal quality?

A:—I am glad you asked that question. The hand separator is coming into Illinois. We don't know how long they will remain with us. We can make just as good butter from hand separator cream if the farmer will take proper care of the cream and bring it to the factories when we want it. The trouble with hand separator cream is, the farmer says, "I am not going to take it to the factory unless I really have to," so we sometimes get cream five or six days old. We can't make first-class goods out of cream that is that old. And then, another thing I have noticed in handling hand separator goods, it seems to me that the butter made from hand separator cream may be just as good as whole milk the day after it is made, but after it is formed it does not stand up so long. I have had one or two commission men tell me that the butter does not seem to be good when in cold storage. Two years ago we made no difference between hand separator cream goods, but last year, he said, we put a mark on all hand separator goods because they demanded it. They marked it so when putting in storage they kept the whole butter and disposed of the hand separator cream when first made.

Q:—Is hand separator cream pastuerized?

A:—No sir.

You are from Iowa all right.

Q:—Then the trouble is with the care of the cream and not with the separator. If you deliver good, sweet cream, no trouble?

A:—That's it. If they would take care of the cream, I have nothing to say about the hand separator.

Q.—Isn't it true that there are a great many hand separator agents telling the farmers that they only have to deliver cream once a week?

A:—Yes, I have know agents have told them they would not have to wash their separators every day, and I told them to tell the agents they did not know what they were talking about. Separators should be washed after you get through with them. I have found separators in creameries that had not been washed every day. That ought not to exist. One man run hot water through his separator and did not wash the pan. I took the pan out and told him it was not clean, and he said he did not know it.

Q:—Was he lazy?

A:—I think it was carelessness.

Mr. Newman:—There is room for education in all lines, no matter whether in the creamery or on the farm or with the dealer. The state of Illinois has started this inspection in as pleasant a way as possible, and after a while it will be police powers and they will say, "Your creamery has got to be kept clean," and so and so, and you might just as well take it pleasantly and clean it. We are trying to bring it to you in a kindly, pleasant way for the first two years. This association will now go before the legislature and ask that these gentlemen who are visiting the farms may be clothed with police powers, and may say to you you shall do it or you must go out of business, for we must have the best and purest food on the market. We pay no attention to the other states, but go along with our own battleship, and we can only do this by co-operating one with the other. In a kindly way we have asked you to clean up your places, but some time in the future you will find you must do it.

Mr. Glover:—The work is being accepted by the creamery men, the operators of creameries; we have received no letters

except those that have been complimentary to our work, even though we call attention to the defects. We have written farmers who have been careless, and the only letters we have received have been letters thanking us for calling their attention to their unclean farms. In each case where attention had been called to their farms they have taken notice of what we asked, except one man wrote back he thought we ought to give a little bit more attention to the creamery. I wrote back that we gave as much attention to the creamery as the farmers; the creamery man says we ought to go to the farmer, so you see we are working between two kinds of people. It has a wonderful influence when the creamery and its surroundings are kept clean and nice, but you can't talk to patrons unless your creamery is kept clean.

Mrs. Purviance:—When bringing milk to the factory do they wash the cans there or just simply take them home as the milk was poured out?

A:—With the Borden people there the cans are washed before they are returned. But the average creamery, they take the skim milk back or the whey back in the cans, and the cans are not washed at all. There is one thing I wish to mention. I hope there are none of the farmers here who take milk to the factory, and when the factory people pull off the covers and take it up and look at it to find that yellow skum on the top—it has been there more than two days, for the covers of the cans are not clean. See that they are washed off and that yellow stuff washed off. We find some of the covers are hard to clean. Get at it with a brush, but finish up with good hot water and put the cans up to drain, and be sure your can is clean the next morning; never put milk in unless cans are perfectly clean.

Q:—Do you use soap?

A:—Certainly, if well rinsed out before putting the milk in.

Q:—How do you manage the milk when it comes in frozen. In regard to taking samples and composite tests?

A:—I was at a factory two weeks ago and a lot of frozen milk came in and I noticed that they took a sample of the milk and knew the cream was frozen. The milk should be melted be-

fore taking a sample. Take a clean cooler and fill it with boiling water and set that cooler into the weigh can and stir it around. Have a tank of hot water where you can set the cans into it before dumping and be sure the ice is all dissolved before taking a sample.

Mr. Glover:—I don't believe a farmer ought to bring frozen milk into the factory. He ought to take pains enough to cool the milk and cover it with blankets and it will not freeze.

Mr. Mason:—A little caution will prevent all that.

A Member:—The two coldest mornings we had, the first morning some frozen milk, but the stirring up they got, we did not have any the next morning. If they will cover the cans there is no necessity for that.

A Member:—We take eleven or twelve cans of milk and have had very little frozen milk this winter; we cover it up.

Q:—What proportion of the cream is hand separated and what proportion is the other?

A:—I have no records with me, but I have completed visiting in Lake, McHenry, Cook and DuPage counties. No creamery received hand separator cream there, but as we go in the western part of the state, there we find hand separators and whole milk. Only one factory here, and that is Belvidere, that takes in anything of hand separator cream. Out in the western part of the state you find hand separation.

Q:—Where the dairy business is most highly developed, where the farmers are making money, they are all whole milk creameries?

A:—Yes sir, in the Elgin district especially.

Mr. Lee:—It is certainly a detriment to the creamery industry that we take in as much frozen cream as we do. Sometimes it can't possibly be helped, but it would be far better if we could get all milk properly taken care of.

Q:—Can the average housewife use this starter he speaks of, the one who gets only a few gallons of milk a day?

A:—Yes sir, she can. Take it with the housewife, she takes better care of her cream as she carries it along, and the day before

she churns she takes some good milk, and be sure it is good, and let that milk sour, and when ready to churn, warm her cream up a little and add this sour milk to it. It will help to improve the flavor.

Q:—To what temperature?

A:—It depends upon where you are keeping the cream. It is a good plan to raise it to 65 or 70 and keep it there to the right acidity.

Q:—And then cool it down?

A:—Yes madam.

By the President:—I would like to say to you that our next session is at 1:15, because as it is a farmers' convention we know the farmer has to be home pretty early and we want you all to feel free to go and come, if you can't stay all the while, but we want you here as long as possible. We shall commence this early so as to have an early adjournment. We have one of the best programs this afternoon, and we want this room full of farmers to overflowing.

We will now listen to a report from the Committee who advised with the Experimental Station on the appropriation received from the state as to how it should be spent. This Association is allowed a committee of five to decide how the money should be spent. By Irvin Nowlan.

Mr. Lindley:—I move that this report be kept until this afternoon. Seconded.

By the President:—It is carried. This meeting is adjourned and we will have the report this afternoon.

WEDNESDAY AFTERNOON SESSION

By the President:—Meeting is called to order.

We will now have the report of the Advisory Committee by Mr. Irvin Nowlan.

Minutes of the conference between the Director of the Agricultural Experiment Station and the Advisory Committee of the State Dairymen's Association.

The conference met at 2:00 p. m. (May, 1903), at the Office of the Director of the Station at Urbana. There were present of the Advisory Committee: H. B. Gurler, DeKalb; A. N. Abbott, Morrison, and Irvin Nowlan, Toulon. Absent: M. Long, Woodstock, and L. A. Spies, St. Jacob.

Professor Fraser was asked to meet with the Committee and present the needs of the work. After a lengthy and careful discussion his recommendations were adopted practically as read.

It was thought wise to recommend that Mr. Glover's salary be increased to \$2,000 a year.

To the Advisory Committee of the State Dairymen's Association:

There are at the present time, four definite lines of work which should be pushed strongly in the Department of Dairy Husbandry. These are, field work, dairy manufactures, the economic production of milk, and the sanitary improvement of dairying, especially as relates to the production of milk.

1. Field Work. This has been conducted in northern Illinois for nearly two years. A year's test has been completed with eight herds comprising 135 cows, and nineteen herds containing 653 cows are being tested during the present year. In addition to the work of testing, Mr. Glover has made many helpful suggestions as to changes of feed, etc., whereby milk could be made more economically.

Since many of the dairy practices of the country are far behind the present knowledge, this field work, which is demonstrative work should, I believe, be increased.

Mr. Glover has thus far been unable to do much field work among the creameries and as there is much need of improvement in their condition I would recommend that he be given a wide-awake practical creamery man as an assistant, to work among the creameries in the northern part of the state.

The work the past two years has shown conclusively that in order to make the field work effective, the person doing it must first become acquainted with the dairy people by coming in close contact and keeping in touch with them. This being true it seems wise for the good of the work that Mr. Glover and his assistant confine their work to the dairy region of the state which lies north of the Illinois river.

Since there are large dairy interests in southern Illinois, especially in the region near St. Louis, field work should be done in that section of the state and if we can have the Department organized as I should like, this work can be done by men from here. For the best good of college work an assistant should be employed to teach the subject of dairy cattle. This man could also do field work in southern Illinois testing herds.

As before stated, this field work, while of great importance, is largely demonstrative work, simply getting dairymen to put into practice methods which are already known to be economical and correct. For the ultimate best good of dairying, however, careful investigation must be carried on in the Department at the University along certain lines not well worked out; the three most important of which are certain subjects connected with dairy manufactures, the economic production of milk, and improving the sanitary condition of dairying.

2. Dairy Manufactures. Experimental work should be carried on in butter and cheese and instruction be given along these lines throughout the college year. The man in dairy manufactures should spend two or three months each year in southern Illinois helping the creameries and becoming familiar with their

needs and conditions. As this work develops there will, doubtless, be need in a year or two of an assistant in this work.

3. The Economic Production of Milk. This subject is a large one and has several phases, one of the most important being, how to obtain good efficient cows. Since dairy cows cannot be produced on a ranch they must necessarily be bred and raised on the dairy farm. The best individuals in the herd should be determined by testing and the heifer calves from these be raised. In order to show the importance of this work it is necessary to know the greatest difference in efficiency of cows and what degrees of efficiency can be obtained in cows at the present time. The only way this can be accurately determined is by placing the cows under known conditions and keeping an accurate record of both the feed and the product. The record of our herd during the past year shows that one cow produced, on the same kind and amount of feed, over $2\frac{1}{2}$ times what another did.

The most economical production of milk does not mean the smallest area of land upon which a cow can be kept. If enough fertilizer and labor were skillfully used upon land a half acre would doubtless support a cow for a year, but this would not be producing milk most economically any more than when a cow is forced to her utmost to make an official test. It would be far more economical to use more land and greatly reduce the expanse of labor.

4. The Sanitary Improvement of Dairying. There is great need for improvement in the sanitary condition of dairying and especially in the production and handling of milk. Experimental work along this line should, I believe be extended. An assistant should be employed to teach the subject of milk testing and city milk supply, and also to assist in conducting experiments in preventing contamination of milk.

In my opinion here is work outlined for all the money in sight and more good will result in pursuing a few important lines strongly than can be obtained in any other way. This plan as outlined will put a little over half the funds into demonstrative work in the field. The wisdom of putting so large a propor-

tion of the funds into this kind of work may be questioned, but I believe it is the best policy until the every-day practices of the average dairyman more nearly coincide with the present knowledge of dairying.

W. J. Fraser.

By the President:—What will you do with this report. You are at liberty to ask any questions you wish concerning this report.

Mr. Hostetter:—I move the adoption of the report and put in the regular proceedings. Seconded by Mr. Mason. Carried.

By the President:—The butter room will be open this afternoon for inspection at 2 o'clock, and the butter scores will be read the first thing at the evening session.

Machinery hall is a short block from here and is open at all times. Nearly all the different manufactures of separators are there, but not all, the up-to-date ones. As there are very few creameries in this section the exhibit is not so large as it might have been.

For the Committee on Resolutions I appoint:

George Caven, Chicago.

H. F. Thurston, Chicago.

C. J. Lindley, Greenville..

G. H. Gurler, DeKalb.

A. B. Hostetter, Springfield.

It is the rule of this Association that all resolutions must go to the Committee before being brought before you to be acted upon. We hope any one who has a resolution on dairying will hand it to the Committee, or to the Secretary. They will receive careful attention and be acted upon at the proper time.

By the President:—Here is a telegram for Mr. Snyder.

A:—He will be found at Machinery hall.

The butter room is open now and you are at liberty to visit it.

If any one has come in since this morning, we hope that they will bear in mind the membership and become identified with us. We want to see this red badge on every man and woman in this hall. It entitles you to the last year's bound proceedings of this convention and also to the proceedings of these meetings

which will be published inside of three months and will be sent to you by mail free of charge. We hope to get many memberships in this Greenville country, next to the northern district it is the best dairy place in the state, as here is where the future work will be largely concentrated for it will help build up and give this country more in dairying. The City of St. Louis will want more milk than you can supply and it will pay any man to put on a few more cows, but be sure you put on good ones. You know a scrub cow does not pay for her board.

The first on the program this afternoon was Prof. Smith, but I have just received a telegram saying that a very serious illness quite prevents his attendance. He extends his best wishes to the dairymen of this Association. We are very sorry to miss Prof. Smith. He undoubtedly will send a paper and it will be put in the record.

We have with us the Inspector of Milk at St. Louis, Mr. Robert E. Pethybridge, and he will talk to us.

HANDLING OF MILK FOR THE ST. LOUIS MARKET.

By Mr. Robert E. Pethybridge, St. Louis, Mo.

Mr. President, Ladies and Gentlemen.

I am very pleased to be with you this afternoon, and glad to see so good a meeting. I will try to give you a little idea of what the handling of milk means in the St. Louis market. If any one knows of it I do, and I don't know half enough.

In my position as milk inspector, I have gained a great knowledge within the past year, and I hope you will pay attention to me—those who have any idea of providing milk for the St. Louis market.

This subject claims the attention and consideration of every dairyman within shipping distance of the city of St. Louis and I have chosen it for the reason we shall have about one million extra people in the city this year, and the demand for pure cream must be met, and also milk, and that I may bring you better acquainted with the milk ordinance which our city is now enforcing, and which will be a benefit to every honest dairyman whether he be in business in the city or in the country.

Milk, for the producer and dealer to be successful, must be produced, kept and handled under sanitary conditions, and the first point that I shall make will be "Cleanliness." Cleanliness in the food, feeding, and keeping of the cows, so that only the purest and best food for the production of milk should be given, the stables to be well ventilated and kept clean and free from any bad odors, by the use of disinfectants and a coat of whitewash in the spring and fall of the year. I would recommend the crude carbolic acid for the sprinkling of the floors of the stables and a little put in the whitewash is a great help in the purification of the building. Cleanliness with the cows, to keep them well groomed and free from filth which is so often seen on flanks and legs. Cleanliness in the utensils, so that no contamination can come from that cause. I have seen cans arrive in St. Louis with milk in them where I could scrape with my thumbnail around the seams in which a nasty yellow grease had accumulated, and the stench of same is disgusting and comes with the neglect of proper washing. All dairy utensils should be first rinsed out with cool or luke warm water and then well scrubbed with a brush in hot water containing salsoda or washing powder and then well steamed out if you have a steam boiler, if not, well scalded with boiling water. I say boiling water because the tendency is not to have the water boiling. The water used for cleaning the pails, cans and all other purposes in connection with the milk should be from a source at some distance from the house and stable, so that there will be no danger of pollution by sewerage, and if not of the best character is should be boiled.

It is not wise to use a cloth for straining your milk, but a fine wire strainer, which, if of proper fineness will remove all that is possible. If a cloth is used it should either be thrown away after using or thoroughly washed and scalded and hung in the sun to dry. There is more trouble arising from the use of a tainted strainer cloth than that would be left in the milk after being put through a wire strainer.

Last, but not least, cleanliness in yourselves and attendants. Clean coat and overalls, and see that hands are well washed before milking each cow and milking done with dry hands. We had an argument on milking with dry hands. I think Mr. Cobb's suggestion in regard to a little vaseline is good and should be practiced. I do not think it is necessary in all cases, but in some cases it is necessary. The practice of milking with wet hands is very filthy, and I have seen the drops of dirty milk fall into the pail which would contaminate a whole milking.

Now the milk shippers sometimes wonder why the dealers in town charge them with so many sours, but it is not to be wondered at when the matter is looked into. When you consider that in milking, the milk is distributed in a fine spray through the air, which if not pure, must naturally infect and form the basis of impure milk. Section 14 of the Milk Ordinance, the first I have that interests milk shippers, deals with and forbids the sale of unclean, impure, sour and adulterated milk, or that from sick cows, or those whose udders are diseased, and enjoins that pure and fresh milk shall be cooled immediately after milking to at least the temperature of 45 degrees Fahrenheit, and maintained until delivered to customers at or below 50 degrees. The penalty to be not less than \$25.00 nor more than \$100 for violation. This is a most important section, and it interests the country dairyman and also the shippers and dealers. This is what is known as the temperature clause, and is placed in the ordinance to take the place of the use of preservatives, which on no account must be used, as they will be sure to make trouble for your dealers and is a dangerous practice.

If you will follow the rules of cleanliness and cooling (especially if done with an aerator and ice water) you will have no necessity for using preservatives and your milk will reach its destination in the best of condition. Let every dairyman put up some ice this year, and if you have not a fine ice house pile it in your barn or woodshed with plenty of straw or sawdust or both if you have it, and it will keep very well.

In the conveying of your milk to the depot or receiving station, be sure to protect the cans with wet blankets over and around them in the summer and the evaporation will keep them cool, and in the winter use dry blankets to keep them from freezing.

The individual shippers have a difficulty here on account of irregularity of the trains, and sometimes he will arrive at the depot and find the train hours late, whereas it should be delivered to the dealer in the city long before the time of its leaving. Much the better plan, where possible, is to have a receiving station in which the milk is kept until the train arrives, when it goes direct from the ice box to the milk car without gain of temperature. All dealers, shippers and creamery men, should get the railroads to put on refrigerator cars, and even those roads where the milk shipments are large, to put on regular milk trains. I am sure the railroad companies would be glad to enter into negotiations for the establishment of shipping stations at their respective depots, as it would aid their revenue in other ways besides the milk business.

In the case of dairymen who live at far distance for the delivery of milk should engage in the cream shipping business and the rules which apply to milk are the same for cream. I would advise your getting a good separator and get the separating done as quickly as possible after milking, and cool the cream off to as low a temperature as possible with ice water direct from the spout of the separator, and the minimum quality must not be less than 12 per cent of butter fat and free from all adulteration, such as preservatives, coloring or thickening matter.

Section 18 of the Ordinance calls for a milk of a minimum quality of 3 per cent butter fat, 8.5 per cent solids not fat and 0.7 of 1 per cent Ash, of which 50 per cent shall be insoluble in hot water.

Section 16 provides that it must be the pure and unadulterated milk, and must not have any of its natural constituents taken from it, or have anything added. It must be as received from the cow.

My experience of the past year as Milk Inspector has been of great service to me, and I have been very much surprised at some of the tests of milk and cream taken from the cans as they arrive at the depot in St. Louis. I have found milk, so-called, which would not pass as skim milk according to the ordinance and section 22. It only contained 1.4 per cent butter fat, and was both skimmed and watered; found several cases which were watered and others skimmed. Now this is not right in the shippers, and constitutes a fraud, and a most serious offense which should be punished. Contracts have been lost, and the dealers fined on account of having such so-called milk shipped to them, but they are themselves to blame in not testing each shipper's milk. I am referring now to a case where milk was delivered to the poor-house in St. Louis and the contractor didn't take the trouble to test his milk, and when it was tested, it was found to be not up to the standard and he lost his contract which cost him \$1,300 to pay the difference between his contract and the new contract. I know that for a certainty. He claimed that he did not adulterate that milk, that it was the same as when received from the depot. That was a hardship to that man, although as I say he has only himself to blame for it. He had not carried out the work he had contracted for, and therefore lost it. We should see that we get what we pay for.

Now concerning the bacteria and their growth in milk. Bacteria are among the smallest and simplest of all living things and belong to the vegetable kingdom, and like plants, require moisture, warmth and food to grow, and can only be seen when magnified by the microscope. When favored conditions prevail

they multiply very rapidly, so that from a single germ, 200 may be produced in three hours, 10,000 in six hours and 10,000,000 in nine hours, 2,000,000,000 in eighteen hours, and milk is one of the finest things to gather bacteria. As they increase in numbers they gather nourishment from the milk or other substances in which they develop, and like other higher forms of life transform what they take into their bodies into useless and poisonous products. This milk becomes sour by the turning of its sugar into acid. But long before milk becomes sour to the taste, it may contain enormous numbers of bacteria and has already become unwholesome, and perhaps dangerous when employed for food, especially for infants and invalids. Especial care should be taken that no person having, or attending on persons with any infectious disease, such as typhoid or scarlet fever, diphtheria, consumptives, etc., should have anything to do with the handling of milk or utensils, for they are likely to become infected, and cases have been traced to the contamination of milk by careless and ignorant dairymen. I have in mind one man who had typhoid in his house. His dairy was situated there and his closet was situated there in which everything was carried through down to the gutter behind the cows into the drain at the back of the stable. Every cow was being milked in that dairy was infected. Typhoid increased amongst his patrons. Fifteen cases of typhoid fever was traced to that party's milk. The Board of Health traced it there and that dairy was closed. I saw that myself, and it shows how careful you should be concerning the infection of milk.

In my experience in the past year, I have taken many samples which have undergone bacteriological examination, and a case which comes under my notice especially I would mention where the milk was produced and handled in a dirty and careless manner was pronounced unwholesome and unfit for human consumption. Nothing particular was the trouble, but the cows were not kept clean and everything was neglected. There was no harmful bacteria in the milk, but simply a natural neglect. I gave him notice to that effect, and he went to work and cleaned, white-washed and disinfected his barns, well groomed his cows and put

a granitoid floor to his milk house, and got a cooler and separator, and the difference in his goods you would scarcely have believed. And contained in the first sample organisms per c. c. too numerous to count, and in the second sample, after he had cleaned up and improved his system and conditions after about eight hours from milking it contained about 15,000 organisms. So you see by careful handling milk will keep hours longer and be much more wholesome than that which is produced in a filthy and careless manner. The handling of dry feed or sweeping so as to create dust should not be permitted previous to milking, as that will cause a great increase in the bacteria in the milk.

Pastuerization has been given out as a cure for all ills milk is heir to, and I would warn you that where it is carried out in a proper manner (and it must be done exactly right) it will be a great help, but it will not make milk which is already tainted or dirty, good, and if you heat it too high or not high enough, or do not cool quickly enough to a proper low temperature your labor will be in vain, for it will be sure to make the case worse. Milk should never be allowed to stand in the sun.

I notice that sufficient care is not taken on the arrival of the milk at St. Louis, and I have seen wagon loads of milk being handled from the car to the dairy, without the least protection in the hottest days of summer and the coldest days of winter. This is another source of deterioration, and is the result of thoughtlessness or carelessness, or both.

I would advise all dairymen to take a good dairy paper and read it and keep posted on what is going on in the dairy world, for you must remember that dairying is the highest point of agricultural science, and those who would be in the race to win must progress and be leaders in that line.

I will sum up in a few words so that you may take them away in your memories, and be of service.

Cleanliness in all things.

Kindness and consideration, not only to your animals, but especially to your employes, as that will aid considerably in the profit of your business.

Equipment. Have the latest and best utensils for your work, with the permanent buildings improved as soon as circumstances will allow.

Regularity and promptness in your business.

Keep accounts, and make a practice of testing your cows, both as to feed, quantity and quality of milk each will give, and remember that small leaks will sink large ships.

And gentlemen, one or two other words I wish to give you each who are shipping. You may be sure the coming year there will be a high price paid for milk shipped into the city. Let your influence go out to your neighbors that if you can only have every one in your district put in three extra cows so as to increase your quantity, it will aid materially in the amount sent to St. Louis. You know milk is a very hard thing to get, especially in the summer in proper condition. The extra price you are likely to get from those shippers it will pay you to take the proper care of it because you can just make up your mind that no sour milk will be paid for. You may as well as not take a little more pains, a little more care and it will pay you well for so doing. I know some of you men will say you have been accustomed to do this and that in the past, and I know it is very hard to teach an old dog new tricks, but because you have been doing so in the past is no reason why you should not improve for the future. Go ahead, progress, get on and if any of you want any information I will cheerfully give it to you.

I am distributing a pamphlet, issued by the city and you are welcome to one of them, also the milk ordinance of the city, and you can study it for yourself.

This milk ordinance has been neglected; the office has been a political one and the person was put in because he was a politician, and he could not prosecute the ordinance as it should have been. Now, the office is practically non-political, and we are carrying out that ordinance as well as we know how and circumstances will allow. We are not a very large staff, but we are doing good work, and we are carrying it out as fair as we are able.

We prosecuted in the city for bad milk between 500 and 600 cases, and we intend to prosecute the cases right along and make the city dairymen do their part. You understand we have no power outside of the city limits, but we know what we can do.

In the first place, the city gives us power to condemn any milk that arrives inside the city limits not in proper condition—that is your loss. In the next place we know very well when milk is tested we can hand over to the authorities of the state of Illinois the names of those people who are not sending milk and shipping according to the laws of Illinois and let them take hold of it and make the prosecutions and take it right from the station before it is delivered and put on the cars. The authorities of St. Louis saw there was no milk law, but in 1890 an amendment was added to the constitution which gave the cities and towns the right to make their own ordinances as they saw the need. That makes the milk laws of Missouri and especially of St. Louis so much stronger, and it does not interfere with any state law. The City of St. Louis is its own master in the milk law.

If we know milk is coming into St. Louis that is not pure we have the right to stop it if it is not according to ordinance.

We hope all of you will do your utmost to try and produce a good straight article for the city.

Q:—In those prosecutions who are the guilty parties, the parties outside or inside the city limits?

A:—They are both, only I am sorry to say that in cases that we have found that the dealers in the city have had to suffer for what have been done by the farmers. I know that from experience. I have taken samples from the farms that have been shipped in from the country, and with the previous day the dealer had told me he had never touched that milk, that it was just the same as received and I believed him because I believed him to be a gentleman. I took 28 samples and out of that number I think five was below 2 per cent and two out of the lot tested 1.4 per cent, both skimmed and watered. Now you see what had been done to that milk. No cow produced such milk and it had been allowed to be shipped into the city. In other cases, the same man

was receiving milk that tested over 5 per cent and paying just as high a price for the 1.4 per cent as for the 5 per cent milk. The farmer was beating him. That is the point and that is the way we find these things. Strange to say that same man that I spoke of in regard to this milk was the same man that caused the loss of the contract of the other dairyman, a terrible trouble and a serious loss to the dealers in St. Louis.

By the President:—Prof. Erf has to go on this 2:59 train and we will have to pass on to the next subject.

SELECTION OF A DAIRY COW.

By Prof. Oscar Erf, Kansas.

Ladies and Gentlemen.

It pleases me very much to have the opportunity to be with you again this year. I have come a long way, but I assure you that I enjoyed having this privilege.

When your Secretary handed me this kind invitation to come down here, I was at a loss to know what to choose for a subject for this convention.

As probably some of you know, I am mostly interested on the manufacturing side, and since the manufacturing side is not of such importance in this part of your state, I thought I would select a subject on the producers' side.

Kansas conditions are so different from Illinois conditions. Kansas has universally adopted the hand separator system. It is a system I might say a step toward the advanced dairying. I assure you that it is a marked step, for any one that intends to retard the progress of the hand separator system might as well bump his head against a brick wall. It is bound to come, and it will come.

I had the privilege a few days ago of attending a banquet way off in the far east, and I heard a man eulogize New York. He spoke about the progress in dairying in that state; I heard a man from Pennsylvania telling about the progress they were making in that state in dairying, and it happened to be my opportunity to talk next, and in a toast, I thought it was not more fitting for me, since I was from Kansas, to say something about that state. I told them of the hand separator system. I told them of the greatest creamery in the world which, at the present time, is making 40,000 pounds of butter a day. I told them that we were shipping cream over 300 miles to manufacture this butter. I told them that this butter was consumed by every soldier that was protecting our government at the present time; that it went all over the world, naturally it must be so since butter is concentrated sunshine it must come from a land of sunshine. I told them of the scientific farmer, and the scientific operations that were going on in butter making. I told them that in a 200,000 pound lot of butter the moisture did not vary over $\frac{1}{4}$ of 1 per cent. That is scientific work, gentlemen, and the Continental people are doing it. They are turning a uniform product out day after day. 85 per cent of the butter that is produced in Kansas today does not vary over 1 per cent in the score. It is all made by that one company. A man from Ohio got up after me and says, "Well, that beats the devil." I informed the honorable gentleman that that was the intention.

He said that reminded him of a story. There was a little girl who was very fond of playing with her pussy and frequently they got into squabbles. This little girl had two brothers, and of course these little brothers once in a while used profane language. She happened to get on to one of these remarks and didn't know exactly the meaning of it. One day she thought she had a chance to use it. In playing with the pussy, the pussy hauled off and bit her and scratched her, and she hauled off and hit the pussy. She says "You are a damned pussy." Her mother was horrified to think of the expression she had used at the time and the impression she left on the child was very vivid. The

next day a similar experience came about. The pussy again scratched her. She hauled off and she says, "You are the—I darsn't say it, but you are the same pussy you was yesterday." This man said that he had an idea that the Kansas winds had an inflating effect on any one that went down there. It was the same old story over and over again, so he finally had to believe it that Kansas was really in the lead of the dairy business.

I am not down here to give you an air furnace talk on the progress of Kansas, or on Kansas. As I said before, I thought it was more fitting to talk on the producers side, namely the selection of a dairy cow. No problem in recent years concerning the dairy business, had attracted the attention of dairymen on investigation more than the proper type and confirmation of dairy cows or economical production of dairy products. A cow may be considered a machine for the purpose of converting rough feed into refined product, called milk.

Different cows have different capacities the same as some boilers have different capacities for generating steam from a pound of coal.

It may be said in general that all cows utilize the food which they eat for one or two purposes, provided the animal is in a good healthy condition.

The first is for the producing of milk, second, for the increase in live weight. Cows which through hereditary tendencies and environment have developed a capacity for transforming food into milk instead of live weight are known as dairy cows. Other cows through influences of the same character acted in an opposite direction and have a capacity for transforming their feed into flesh and fat on their bodies, and the milk produced from such cows is of little importance and used entirely for calves, and are known as beef cows.

Between these two classes we find a large number of cows with some of the characteristics of the dairy cow. In so far as giving a legitimate quantity of milk is concerned with those of the beef cow which produced calves, which are profitable for the owners for beef cows; such cows are dual purpose cows.

From these widely different purposes dairy cows have shown a confirmation widely different from that of the beef cows. The confirmation and external appearance is a fairly safe guide from which to judge her purpose. It is not an easy task to judge the capacity of a dairy cow for producing milk and butter fat economically from her external appearance and confirmation.

It is plainly evident that success in dairying is in capacity in individuals and not in the herd. There are such wide variances of the same breed.

The merits of a dairy cow can be estimated by accurate records of pounds of milk and testing the butter fat. These alone will not accomplish all the qualities that are possible for the dairy cow to possess. The question as to how long the cow has the power to continue the flow of milk during the period of lactation from year to year, whether she has a strong constitution are points of excellence to be decided in the cow. These factors aside from the regular confirmations or the pounds of butter fat must depend upon the good judgment of the dairyman in selecting his animal by external confirmation.

The type of a good dairy cow we have often heard, and such expressions as "the dairy cow must be wedge-shaped, must have large nose, thin neck, large paunch and broad between the thighs, large udder, large milk wells and veins" are, strictly speaking, means to an end.

The first and all important point in selecting a cow, is to note the size of the udder, whether it is large, uniformly shaped with the teats well placed the proper distance apart; to note whether the udder is flabbor and not fleshy, which is particularly apparent after milking. According to the general rule a cow that is a large milker must necessarily have developed a large udder, and if in a healthy condition, is the indication of the sufficiency of the animal. The development of a large udder requires a good supply of blood, and a large blood supply means a large heart, and healthy skin and the milk veins more apparent which run from the udder to the anterior portion of the body.

However, all good dairy cows do not have large milk veins, for the reason that some arteries may be large and receive the larger portion of the blood from the udder. A large and well developed circulation necessitates a large respiratory action to purify the blood used in the skin. Not only that, but the heart, which is the pump which circulates the blood, must be supplied with energy by a well developed nervous system to keep up its function.

The blood is made from the food which the cow consumes. In order to keep a steady supply of blood, there must necessarily be a large digestion, and these are the important factors which are closely connected for the production of milk, as also large nose which must admit a large supply of air to the system, a large mouth and large mastication to supply the digestive organs.

According to the theory of evolution, we find mere traces of these glands in the lower types of animals and animal life, until they gradually develop from the various stages until these particular glands reach their highest development in the dairy cow. We find a thousand little milk tubes opening on the surface of the skin. The secretion when liberated is licked off by the young and supplies the food for their nourishment. These glands assume a more compact form and a number of milk ducts empty before opening on the outside of the skin. As we come up the scale of life we find the development is more pronounced. Since these conditions are natural facts, it indicates that there must be a somewhat parallel development with the glands as well as with the udder.

Cows with large nervous systems are probably the most efficient milk producers if kept in a good condition. A cow of this nature reduces her flow of milk when ill-treated, and she responds to good treatment. A strong or nervous temperament although not a large milk producer, is the best cow for the average farmer. Discomforts or ill-treatment do not affect the milk supply as much as in the higher nervous animals.

A dairyman should not alone rely on confirmation, for the Babcock test and the scale with the milk pail and accurate meth-

ods determine the profits or loss of an animal. We have this assurance from our friend, Mr. Glover, who is doing this work in the northern part of the state. He is finding a marked difference in individual animals, and certainly is doing a great work in that line.

I have not given you anything particularly new. There are other principles that depend on the efficiency of a cow, such as the proper feeding and the proper milking, which are very important factors.

You probably all understand or know of the experiment that has been carried on in Wisconsin by Prof. Woll—manipulation of the udder to increase the flow of milk. We have taken up that work in Kansas. For the past few months we have developed the efficiency to quite an extent on a number of cows, but in figuring out the time that it takes to manipulate the udder and the extra amount of milk that was given, we found that it did not exactly pay. We are making other tests, but do not know what the outcome will be. We are happy to say we have found another scheme that is more economical for the manipulation of the udder. I don't want to spring anything radical on you here, but we are using electricity to develop or stimulate the udder. We have no results at the present time that we want to give you as fundamental principles. We have tried to stimulate the udder by a current of electricity, and we find that with a half cent's worth of electricity we have increased the flow one quart or two pounds of milk. Whether this is due to the natural condition of the cow; whether she could have naturally given that much we are not ready to say. At any rate we are working along that line and expect some results. We don't know whether we are going to accomplish anything, but we trust we will.

I thank you ladies and gentlemen for your kind attention.

By the President:—We had on the program this afternoon this professor from Kansas and one of our professors from Illinois, but we will have to use them as two pieces of bread for the

sandwich and put a good honest farmer in between the two of them. Mr. Mason will tell us how to realize the most from our high-priced land.

HOW CAN WE REALIZE THE MOST FROM OUR HIGH PRICED LAND.

By Mr. J. P. Mason, Elgin, Ill.

Ladies and Gentlemen.

Farming is a good deal what we make it. There are comparatively few of the many farmers who fail. When we look on the other side, in the business and commercial products with all the ability and push they got, there are but few who attain success. It leads a person to think that possibly there might be something in farming.

I don't take any stock in running a farm simply for making a living. Why shouldn't the farmer have interest on his capital, and the profit will be governed by the ability of the farmer by the raising of larger crops, and carrying more stock and the successful feeding of stock, which is the key note to successful farming.

Putting the farm on a good solid basis helps materially to build up the substantial and pleasant home farm. It helps to keep your boys on the farm, by showing them that farming is good or better than many other vocations.

Where is there the opportunity for advancement as much as in farming? There are new ideas coming to the front, not only the breeding of grains for larger yields, but the study of the soil, breeding and feeding, etc., and all these are the results of study.

Every farmer that owns land wants to own good land. He not only wants to keep it good, but if he keeps pace with the steps of progress, he should make it better and more productive. The question today that confronts every farmer is, how can he realize the most from the land and still keep up or increase the fertility of the soil? By doing this is what makes land valuable and profitable.

Dairy farming offers a number of advantages over other lines of agriculture. A very important matter is the keeping up of the fertility of the soil, although usually the crops are cultivated and the products hauled off and sold. One-half adds to the capital and the other takes from it.

If stock is fed in the barns almost all the fertility is saved and this will help the farm. Feeding is usually done in open yards and some of the fertility is left, while if fed in the house it is saved and hauled out to the fields and spread.

In this business the market for your dairy product does not fluctuate as much as other products. It makes steady employment for your labor the year around. We contract for the milk six months in advance and you can tell any day what your expenses are and what your income is and you can tell where you are going to get off in the next six months.

With this there should be better farming and more thorough cultivation of the soil. You often see corn growing where the land has produced twice as much when cared for than when not. The trouble is the farmer tries to farm more than he can do thoroughly. It is the small farms that pay better than the big ones. He raises more crops and more stock to the acre than the large ones. It is the same with the dairy business. A farm with 50 to 150 cows will give better returns. In the small farm, the land is all available and you can practice this soiling system which is a saving of land and a saving of fencing and production is more economical and conditions are better. It should inspire confidence among you. Many of these large dairy farms that are cut in two in the middle and put the same amount of work on half as was being done on the whole would make better paying

farms in a short time. They could carry as much stock as if they had used the whole farm.

Keep a farm book account. You want to realize the expenses and labor, insurance and taxes on one side, and you want to see the farm products sold on the other side balance and leave a satisfactory profit. What we should do is to make one acre produce what formerly two acres produced. It would not take much to do that on some of Glover's figures on some of these farms.

About the grain question. Sell the grain and keep the fodder in the field—that won't increase the production of your farm. The corn should be all cut and we farmers wouldn't leave corn crop in the field any more than hay or oats. It is good feed and all stock like it. We can't use silo, because markets won't take milk from a silo. We have the best market and we have to do as they say. There is no better wholesale market than we have got. Factories receive 100,000 and over of milk. They do the straight thing by us and we feel like doing the straight thing with them.

I have made milk exclusively on the corn crop with the addition of bran. While it is not what we consider a good ration for a cow, I use it. I want to show the difference between that and selling the grain. Take 50 bushels of corn to the acre for comparison. The farmer that sells his crop gets less in the end. We feed our cows with threshed corn and the fodder furnishes the roughage. The dairy was milked three cows to the can. We fed those cows on an average of 20 pounds to a cow or 60 pounds to produce a can of milk. We sell milk at \$1.00 a can and this acre of corn can be figured as producing 93 1-3 cans of milk. Put bran meal with it at \$19.00 a ton which is \$73.33 for an acre of corn turned into milk. As I say this may not be a good ration for a dairy cow, but we can't but feel we got a fair price for the corn so we can't be called soil robbers.

I have a neighbor, his went 71½ bushels to the acre and mine went 73 and 74 to the acre. We fed differently this winter. He don't like to buy bran and I don't like to run a dairy without

it. He fed his dairy 12 pounds shelled corn ground fine and 4 pounds oil meal mixed with fine cut clover hay; three feeds 16 pounds a day. His dairy is milking at the rate of $2\frac{1}{2}$ cows to a can of milk and he is receiving a \$1.00 a can this winter. I feed my dairy 11 pounds of corn and cob ground together as fine as I can. 2 pounds of bran and 2 pounds of oil meal which makes 20 pounds, and we are making $2\frac{1}{2}$ cows to a can. Ten pounds of clover hay too, each. It shows a little figuring on farming. After you deduct what he buys, and I deduct what I buy, I have \$8.70 more an acre for my clover and corn than he has for his. You see it shows you can figure a little on farming. He gets \$64.72 I think an acre for his land, clover and all, and I get \$71.44 for mine. That ain't like some of them done with their ensilage where they can raise enough to keep a cow 30 months, but it is a business that will hold water, even if a dairy business. If you follow that up you can take an ordinary farm and farm it carefully and keep it heavily stocked, and in a few years you can double the product of that farm, but you want to be thorough. That is one thing you have not learned.

Don't work a farm when it is wet. Don't haul manure when wet, you want to work dry. Many farmers engaged in the dairy business have never yet realized they have got to produce milk to make money in the dairy business. It don't take a very large farm if well filled, and in a little while he will want to cultivate more and have a large dairy and make a ton of milk a day, and that will give you a handsome income. It will increase the production of the farm from year to year, and that is better than selling grain. I don't know of any better way to do it than to increase your dairy to make money.

I know of a farmer who paid from twelve to fourteen thousand for his farm and he has paid for it and got as nice buildings and all out of debt and money ahead. I asked him how he did it and how he fed his cows. He fed eighteen pounds a day and two pounds of oil meal and a shock of corn in the yard, and if I take that shock of corn away the milk goes down. He is as successful a farmer as I know of, and they all feed along that line. All

the success I ever made of farming or dairying, I lay to liberal and heavy feeding and good calves and regularity in milking and feeding and trying to select good cows as close as I can.

I don't think I can say anything more.

DISCUSSION.

Q:—How long will your cows last feeding the ration you feed them?

A:—They last quite a while. We try to get all out of them as quick as we can.

I have noticed these three things. You take a dairyman or a farmer. He goes on in the spring and thinks there isn't anything in farming and he can make up his mind there is nothing in the fall. You fill a dairy cow to her limit and she can be held there only by careful handling. Then you stock the farm up to its capacity and that will increase the production of your farm and as his milk checks begin to get larger those dairymen will begin to thaw out a little and think that he is doing some business, and the more he gets into it the larger the checks will get.

Mr. Glover:—Do you feed the cow that is giving 60 pounds of milk the same ration as the cow that is giving 10 pounds?

A:—You've got to know your cows. Mr. Glover is helping us in northern Illinois, and we are willing to work with him. They are beginning to realize the value it is and what it is going to be worth on individual cows. No, we don't feed them all the same. I feed 20 pounds, and I have got good pay for my feed and labor and interest on my investment. I can't comprehend how these others feed.

A Member:—I got cows that are giving 30 to 40 pounds of milk on 8 pounds of grain a day. I have no clover hay at all and I can't afford to keep bran or oats.

A:—I get \$8.70 more than my neighbor who feeds less.

Q:—How many cows did you milk in November?

A:—I don't know.

Q:—Can you tell us how many cows you milked and how much you got for your milk?

A:—I can't, but two cows to a can of milk.

Q:—How many cows?

A:—Fifty cows in the dairy; some fresh and some been milking all summer.

Mr. Glover:—Do you turn your cows out this cold weather to get the corn stover from the field?

A:—Well I guess not. They are kept in the barn. You can't be too careful. They are tender and want to be well treated. They are turned out only a few minutes each day.

Q:—Can you give us something in the way of a month's results so we would know what you got?

A:—Somewhere around \$600.00.

Q:—How much for milk?

A:—One dollar a can. Just about the same as you are doing here, I should judge.

Q:—One dollar and fifty-seven cents this month?

A:—One dollar and fifty-seven cents this month.

Q:—Do you shred your fodder?

A:—We cut it after husking it.

Q:—You mean eight gallon cans?

A:—Yes sir.

A Member:—We use ten.

A:—Is that so?

Q:—How much corn and how much bran and how much of that oil feed did you say?

A:—My neighbor feeds 12 pounds shelled corn ground fine and 4 pounds linseed meal that makes 16 and fine cut clover hay. I feed 11 pounds of corn and cob meal ground fine and 7 pounds bran and 2 pounds of oil meal, that makes 20 pounds, and 10 pounds clover hay each one of us feed.

Q:—Why do you prefer corn cut instead of shredded?

A:—I think it works nicer in the manure for one thing.

Q:—Do they eat it as well?

A:—I think there is not much difference.

Q:—How long did you cut it?

A:—Two or two and one-half inches, as long as I can cut it.

Q:—Any trouble with sore mouths?

A:—No sir. The nicest kind of bedding, and put it on your land and there is nothing nicer for the land.

Q:—What is the average number of years you use your cows?

A:—That is a pretty hard question to answer. We thin out every spring and we don't keep as many in the summer. They are well fed and bring as much as they cost and sometimes more. Sometimes four or five years; until they begin to play out. I don't like to buy old cows, I want them young.

Q:—What is the average of your good cows?

A:—I don't know.

Q:—For dairy purposes?

A:—That is pretty hard to tell. Some will stick to it ten and twelve years. I was talking with Mr. Henry Bosworth, who owns seven farms, and he said about 25 per cent of the cows were sold every year; that would be about four years. He buys his cows.

By the President:—In the Elgin district, nearly all the farmers buy their cows.

Q:—How fine do you grind that corn and cob?

A:—Just as fine as I can get it. Never saw meal too fine to feed to cows.

By the President:—Mr. Lindley has just received a telegram from Lieut. Gov. Northcott, saying, "I will arrive in the court room about nine o'clock tonight." Lieut. Gov. Northcott will speak to us tonight at nine o'clock. Until that time we have several addresses and papers.

WEDNESDAY EVENING SESSION

Convention called to order by the President.

We have some pamphlets here from the University of Illinois telling about dairying, dairy husbandry. If any one would like to get one of them, I shall be pleased to distribute them.

Music by Reed-Hillis orchestra of Greenville.

Encored.

By the President:—Mr. Lindley has a wire from Lieut. Gov. Northcott in which he states he will arrive at the court house at nine o'clock. So we will make this change in the program and have the other speaker first.

I now have the pleasure of introducing to you Mr. W. W. Marple, of St. Joseph, Mo.

ADDRESS.

By Mr. W. W. Marple, St. Joseph, Mo.

By the President:—I am pleased to introduce to you Mr. W. W. Marple, of St. Joseph, Mo. He is the president of the Missouri State Dairymens' Association, and, of course he comes to us labeled, "I am from Missouri."

Mr. President, Members of Illinois Dairymens' Association, Ladies and Gentlemen:

I am not unmindful of the very high honor conferred upon me by your excellent President and Secretary in asking me (a Missourian, from the land where they have to be shown) to

address this noted organization on this auspicious occasion, your thirtieth annual convention. I am not only deeply impressed with this honor, but highly gratified at this opportunity of expressing to you who are here, and through you to this enterprising, progressive, resourceful and historic state, the greeting, the highest appreciation and the deepest feeling of gratitude from three million warm-hearted hospitable Missourians for what you have shown them, and for the inspiration they have caught from you, sufficient to encourage them in the developing of the greatest resource in their own land, and the most interesting, elevating and remunerative branch of agriculture in any county where conditions are favorable.

To me, this is not only a great state because of its history, its resources and its people, but it is a hallowed spot and I am permitted to press my feet on its soil with mingled feeling of joy and sadness, of satisfaction and disappointment, of tranquility and turmoil, because it was here I saw consigned to their last resting places the mortal remains of an indulgent father, and of her who bore the sweetest name in the English language—Mother, and although it does not seem long until a half a century will have elapsed since I, almost unconsciously, followed her to that sacred spot, and almost a quarter of a century since I laid him, whose helpmate she was, by her side. The memory grows greener, and with each succeeding year the spot seems more sacred, and with the name of Illinois is associated hallowed memories and the most sacred recollections.

With the utmost faith and most implicit confidence in the business represented by our organization and the very deepest heartfelt interest in its progress and the unlimited success of those engaged in it, recognizing as I do the universal Fatherhood of God and the brotherhood of man, it affords me pleasure to have this opportunity of exchanging confidences, interchanging ideas and bidding you God speed in your well directed efforts. You have attained the high standard in your work, the world wide reputation you enjoy and the satisfactory results from your labor by following the precepts of the little girl, who, when she said

here evening prayer, asked God to make her a good girl, and then added, "if you don't at first succeed, try, try again."

You have accomplished it on the same plan adopted by the old darkey, who said, about ten days before Christmas he began praying to the Lord to send him a turkey. He prayed fervently every night for a week and still no turkey. He then prayed the Lord to send him to a turkey, and he got one that night. You have gotten what you have by going after it.

This is not only an interesting and instructive meeting, but to me has associated with it solemnity, not alone because of the wonderful interests and sacred trusts represented, but in addition the time at which you have convened. This is the beginning of a new year. This is immediately following the old. Another revolution of the great clock of the universe that marks time and the figures on the dial have changed. Like an immense music box that is arranged to start by dropping in a coin. We have dropped the deeds and occurrences and transactions of another year into the slot and started the machinery to play a new tune. Father Time has reached the cord that rings up the fares, and as we pay him (in his own coin) our transportation to another division. He rings the bell, 1903 disappears, and on the face of that recorder can be seen 1904. This gigantic omnibus (in which there seems to be always room for one more), this wonderful conveyance that is beyond the comprehension of finite minds, this means of transportation, the magnitude of which we are unable to conceive, this train of cars (the length of which is beyond human vision to discern) encircling the universe drawn by an engine on the throttle of which is the infinite hand of Almighty God. For 6,000 years has continued to move carrying its load of human freight from time to eternity. It has never stopped. The machinery has never ceased to run. Millions have been landed at their destination. Millions more have been taken aboard and are making the same journey. We are only reminded each year by a click of the cog, a ring of the bell and the change of figures on the meter, that we have passed a station. With each succeeding year, this conveyance seems to move

a little faster, and tonight there are billions on board and you have assembled for yourselves and in the interest of the state which you love.

To discuss means by which you can make this journey more attractive, more interesting and more profitable is the reason of your presence here. To discuss what might have been is past. This is not the age, and you are not the people to stand on the banks of a mighty river and yearn for the water that has gone over the dam, for you know the mill will never grind with the water that is past.

The opportunities of 1903 are beyond the possibility of our embrace. The mistakes of last year have been charged to our account and can never be erased; but (except as we may use this experience as a lamp to guide our feet) we will blot from our memory the mistakes and omissions and errors and shortcomings and failures of the past, and behold with a brighter vision a greater interest, a firmer determination and a universal resolve the glorious future as it unfolds to our imaginative minds a field more beautiful than we have ever seen and results we have never yet attained.

A preacher met a boy with a dog one day, and he said: "Is that your dog, little man?" The boy said, "Yes sir." The preacher says, "What do you call him?" The boy said, "His name is Moreover." The preacher said, "Moreover, that is a funny name for a dog." The boy said, "I don't think so." The preacher said, "Where did you get that name?" The boy said, "You ought to know. That's the name of the dog in the Bible." The preacher says, "You must be mistaken. I never heard of a dog named Moreover in the Bible." The boy said, "Well, there is and he's a fighting dog." The preacher said, "Where do you find it?" The boy said, "Don't the Bible say 'and moreover the dog licked Lazarus.'" It is very easy to destroy the sense of a paragraph by leaving out a part of it, and it's just as easy to destroy our lives in our own estimation and find room for complaint by only taking a partial review. The result for weal or woe, so far as our lives are concerned is changed very materially

in proportion to the way we look at it, the same as the meaning of a sentence is changed by the way we read it. A man hung up a sign "Adam Good Shoe Maker." Another man came along and read it, "A dam good shoemaker."

I'm impressed that possibly we are just a little prone to complain. We are disposed to be pessimistic. We look on the dark side. Things don't go right, and we kick. I am reminded of a circumstance that is said to have occurred in Chicago during the World's Fair. A noted orator from the south consented to address one of the many meetings that were held during that time. As he was an orator of some note, a large crowd assembled to hear him, and were anxiously and impatiently awaiting his arrival, when the Master of Ceremonies discovered that the speaker was drunk almost to unconsciousness. He was berated soundly by some of his friends and given to understand he had to speak, drunk or sober. He gathered himself together and staggered on to the stage and was introduced. He said "Ladies and Gentlemen" in a very low tone of voice. Somebody in the back part of the hall cried "Louder." He repeated a little more distinctly "Ladies and Gentlemen," and again the voice cried "Louder." This irritated the speaker, and in a clear distinct voice he said, "Ladies and Gentlemen—When the end of the world shall come, when the angel Gabriel shall blow his trumpet and as he stands with one foot on the land and the other on the sea, he shall proclaim that time shall be no more, some d—fool from Chicago will holler 'Louder.'"

There is an institution in your state, the founder of which contributed more to the comfort of the traveling public as they crossed and recrossed the continent and encircled the globe than all other sources combined, and in that marvellous town, a monument to the ingenuity, sagacity, foresight and business ability of George Pullman, they continue to build and equip modern palatial homes on wheels, and in these palaces provided with library, smoking room, dining room, sleeping room, parlor, veranda, barber shop and bathroom, we are permitted to travel from one place to another on business errands while we enjoy

all the comforts of our home. The man of large business interests whose time is money, is now able to cash it and as he madly rushes from his country seat to his place on 'Change in the busy bustling city, he is no longer detained on the way, for he sleeps and eats and smokes and rests and reads and writes and shaves and bathes while he is being transported with lightning speed. Among these magnificent structures there is a car called Illinois, and as if to sustain the reputation of the state for which it is named, it is more than all the rest a vision, a dream of the 20th century. The architecture, the design, the finishing, the appointments, are all products of a master hand and give unmistakable evidence of an artist's touch, and as this "thing of beauty," this traveling home of ease and comfort, this acme of perfection, the pride of the builder, goes flying across the continent, it is a constant reminder, an everlasting advertisement of and an active, moving monument to the great state whose name it bears, Illinois. And I am reminded, and I take this occasion to suggest to you that the car on which you are making your journey, this portion of the great train, furnished by omnipotence, this wonderful conveyance on which is your home and all the conveniences that you enjoy, and which car is the product of the supreme architect and builder, is the reality of what the other is a type.

My fellow citizens, in the naming of your state it would almost seem that the guiding hand of Providence could be seen, or else, after it was named, He fulfilled the prophecy of him who said better than he knew, when he called this spot on the map a name that meant "Superior men." History is full of wonderful achievements accomplished by Illinois men. A mere suggestion, a single reference is sufficient to bring to mind the memory of those whose names were immortalized, and for whom the country was indebted to your own honored state.

For the heroic deeds of your illustrious sons, and for your many striking examples, worthy of imitation, I would come tonight and lay at your feet as trophies from a grateful people the acknowledgment of a debt they will always be anxious to

repay. You have been a history making people. With the name of Illinois is associated the name of the most remarkable city in the world, not alone because of its size, but because of its location. Its value as a market for the products of the west, its necessity as a distributing point, and more than all, because of its personnel, that (when completely destroyed by fire) that caused it to be rebuilt larger and better than ever, even before the debris had quit smoking and the ground had cooled off after the greatest fire of the century.

It is seldom we peruse a paper that we are not reminded of Illinois by the mention of him, whose name was associated with that wonderful national convention in your windy city the summer of 1896. When the political party represented at that meeting was almost on the verge of stampeding, it remained for Illinois to furnish a man (one of her own sons) who, with his magnetism and his oratory, poured oil on the troubled waters and electrified a nation with the most wonderful oratorical effort of the age, and whatever may be our political faith, regardless of our political prejudices, aside from any personal opinion, any of us may have concerning his views, everybody is glad of the opportunity to put himself on record and the entire people are of one mind with no division of sentiment, that the name of W. J. Bryan belongs on the enrollment of Illinois' illustrious sons.

When farther back on the page of history, it was the earnest desire of his party to make him leader; when they determined to place him at the head of their ticket, whose name was synonymous with supremacy and political loyalty in their supreme anxiety to repay the man (whom everybody delighted to honor for his superiority, by putting him in a position they doubtless felt the American people owed to him, they selected the man to present his claim, who, in his lifetime had no peer as an orator, and it was an Illinois man who immortalized himself and made prominent the state in which he lived through that wonderful speech, in which he placed in nomination for President of the United States the man he called the Plumed Knight, James G. Blaine, and every

Illinois citizen (regardless of his religious faith) can not help but feel proud of his who was dubbed by Europe, America's silver-tongued orator, and they have placed on the roll of illustrious citizens the name of Robert G. Ingersoll.

I wonder if these men are so plenty they become common to you. I wonder if the wonderful achievements of great men are so frequent among you that you fail to appreciate them. I am reminded of a circumstance said to have occurred in a Chicago hotel. A gentleman and his bride went to Chicago to spend a few days, and when the man went up to the counter of a hotel to register while his wife waited in the lobby, he remarked to the clerk that he was on a little wedding tour, and would probably be there several days. The clerk smiled and called a bell boy and told him to show the gentleman to the Bridal Parlor on the first floor and at the same time said to the man, "\$15.00 a day." The man touched the clerk on the shoulder just as he was turning around and said to him "This is my third wife." The clerk hollered to the boy, "A back room on the top floor," and said to the man "\$4.00 a week." It is unnecessary to suggest that this policy in this particular case appeals to every man here as being mean, and yet, I venture that some of these ladies have a faint suspicion that that happened, and that there are some men that would do that.

You remember Josh Billings said "The more he got acquainted with men the better he liked dogs." He would not have said this had he lived in Illinois, but outside of this state and possibly in some sections of this state there is a great deal of selfishness, and to these good ladies I am going to acknowledge that the most of this selfishness is among the men. I noticed in the paper the other day an occurrence that illustrates some men's dispositions. A man was telling a friend of some controversy he had been having with his wife about the purchase of some sheets or towels, or something of that kind, for the house. He said she wanted linen and he wanted cotton. After considerable discussion he said they compromised. His friend asked him what on. He said on cotton. If there is a man here to-

night who is not married, but expects to be, I would not deceive him by trying to make him believe that all questions of difference between man and wife were settled that way. In fact, I think I would feel that I had slandered somebody if I did not warn you that ordinarily the compromise in the above case would have been on linen.

Although forty years and more have elapsed since the memorable political campaign of 1860, it is still fresh in the memory of many who are here, and the result will never be forgotten. It was an unusual campaign. It stands out single and alone of all political efforts, from the time of the establishment of a Republican form of government until the present. It was a conflict between two giant intellects. It was a fight for supremacy between two great men. Every inch of ground was contested and the seat of the conflict was here. Every school house was visited, every town celebrated, every village and hamlet had a meeting, and oratory was heard from every stump. Grave questions were discussed and intimations were made that alarmed the people. Occasionally a little cloud appeared in the political sky that we were told indicated a storm. The atmosphere was close and oppressive which seemed to threaten a cyclone. Finally in this Democratic form of government, which is for the people and by the people, they decided the question, and that illustrious citizen of yours, the Illinois rail splitter, was placed at the head of the government. The fulfillment of prophecy came like a clap of thunder from a clear sky. It came to us in the shape of war, the like of which was never known. It came to us with the report of military guns on the field of battle. It came to us with the horrors of prison, with rivers of blood and with the devastation and desolation of a beautiful country. It came with acres of cemeteries, with thousands of unknown graves, and with an army of crippled men. It came with the shrieks and lamentations of those who were left. It came with a legion of widows and an army of orphans and the breaking up of families, and the destruction of property and all the horrible incidents of war. It came to us through thousands of happy men

who returned to their once happy homes to find their families scattered, their cattle confiscated, their buildings burned, their improvements destroyed and their money worthless. It came to us through disrupted families, sectional feeling and bitter denunciation.

During the four years of the blackest war clouds, the troubled waters, the tempestous sea, the old ship of state launched nearly a hundred years before, and whose first captain was Washington, was guided safely into port by the renowned pilot who was selected from that country, the name of which signified superior men, and whose steady hand never let go of the wheel and whose keen discerning eye was never detracted from the channel. And this is not all. When the day seemed the darkest, when the chances seemed the least, when the messages came to this wonderful man who was commander general, and who seemed to be guided by wisdom divinity that his great army was being rapidly reduced and that defeat was following them everywhere, at that time when he might have been expected to falter, he saw the necessity of more help in the management of the army in the field, and the sequel proved wisdom in the appointment of an Illinois man to take charge of that great army, and you were permitted to place on that roll of distinction the name of him whom the whole world delighted to honor, Ulysses S. Grant, and when finally he (with characteristic modesty) received the sword of him, whose memory we all revere, the war was over. When the pilot's mission seemed to have been filled, and the Lord of Hosts said to him "Well done, come up higher," he was removed and a nation mourned his loss and a monument was erected to his memory in every section of the country. And when every citizen of the United States, black and white, north, south, east and west, of every religious belief and every political faith sought to manifest their love, then in the hearts of eighty million people was there a monument erected, and on the tablets of their memory was written, never to be erased, the name of him who everybody loved, Abraham Lincoln of Illinois.

This is not all. I might mention the names of John A. Logan, and your war governor, and many other illustrious men whose individuality stands out prominently before the world, and whose names are known in every household. Many of them have answered the roll call in eternity, and many are with you now, lawyers, politicians, preachers, educators, etc., etc., but time forbids. I simply ask the privilege of reminding you that on this roll of distinguished men in your state, I have reserved a place above all the rest for nearly 300,000 brave unselfish men furnished by Illinois to whom we are indebted for a peaceful home and a reunited people, men who gave up everything they had and without hope of reward, offered themselves a sacrifice on their country's altar. The brave men who responded to that call, and quietly and unostentatiously shouldered their muskets and slipped away to bare their breasts in the thickest of the fight to the enemy's bullets to preserve for me and my children, and you and your children, a home intact, deserve not only a place on the roll of honor and distinction, but a monument, the limit of which is space, and on which shall be written the name of their state and the eternal remembrance of a grateful people.

An immense crowd of people had filled every foot of space in a large amphitheater, as they waited for the exercises to begin, a band of music marched down one of the aisles playing "God Save the Queen." It struck a responsive chord in the hearts of a thousand Britishers, and they rose to their feet and cheered to the echo. As this band reached the platform and ceased to play, down another aisle a band came playing the Marseilles Hymn. This met with a hearty response from a group of Frenchmen, and as the strains from that piece of music (that stirred the deepest feeling in the breast of every loyal Frenchman died away) another aisle was invaded by a band playing, and you had only to watch the enthusiasm of a group of loyal Germans to convince you that they were playing a German National air. And on and on the concert continued; the great National medley was not complete until each nation had been represented by a band that played their favorite National air, and the Italians,

Swedes, Russians and Irish, Scotch and Swiss all went wild with enthusiasm as each listened to the music that reminded them of their nativity. Finally, at least one-half of that immense audience which could almost be calculated by the acre, rose to their feet and shouted until they were hoarse when they heard "My Country 'Tis of Thee, America," the National Hymn of the land of the free and the home of the brave, the greatest nation on earth, the native home of nearly half that crowd, and the adopted home of a large proportion of the rest.

The climax had not been reached, the flood gates of enthusiasm had not yet been opened, pandemonium did not reign supreme until a band began to play "Home Sweet Home," the rest all joined. Everybody rose and sang and 50,000 people joined in singing of the one spot sacred to them; of the one spot more to be prized than all others; of the one spot that knows no country; no nationality, no creed, no sect; the one spot that occupies the same place in the hearts of the civilized world; of the one spot in which everybody from every direction had a common interest. Home—what a wonderful word, and I am impressed that there are none to whom it appeals so strong and means so much as to the occupant of the home on the farm.

These are the people who played a conspicuous part in that wonderful war. They ploughed the ground and harrowed the field and cultivated the soil and raised the grain and fed the stock and protected our homes, and took care of our mothers and sisters and wives and children and sweethearts, and they quietly and persistently discharged their duty without excitement. No martial music there, no hurrah, no demonstration. In some instances they were even slandered for not fighting. Shall we forget these, the bravest of them all? Never, and it is of these we would talk. It is for these this meeting is held. It is subjects that interest them that we are here to discuss.

While in my very meagre and hurried preparation for this occasion, I have not overlooked that question that interests me more than any other and that I am always glad to discuss—some phases of dairying. I am desirous of impressing you with

the increased responsibility resting on you in consequence of your superior advantages. In addition to this I acknowledge some embarrassment in attempting to discuss a subject on which there are so many eminent authorities present. I know of no way that I can explain my situation so well as by relating a story of the old maid's experience at a circus. When United States Senator John M. Thurston told this at the Opera House in Lincoln, Nebraska, he said it occurred in southern Illinois, but I expect it happened in Missouri. In any event, this old maid had spent her entire life in a small town and had seldom been away from home, consequently was deprived the privilege of seeing very many things that are to be seen in a larger place. She also knew very little of the world as compared with those who mingled constantly in society and whose acquaintanceship extended over territory, and who were brightened up by travel and contact with people in various parts of the world.

Among the many desirable pleasures that had been denied her, a very prominent one was attending the circus. So, finally, when she was permitted to read the large posters advertising a circus coming to her home village, her heart was filled with joy, and she determined to satisfy her curiosity by attending the show. Notwithstanding frequent impressions that possibly it was not exactly the thing for one of her age and steady habits and high sense of propriety to attend a circus, she decided to go. When the day came, she attired herself in her best clothes and wore her nicest corkscrew curls, and marched straight up to the ticket wagon, bought a fifty cent seat, and was one of the first to enter the tent. When inside, after looking around awhile, she decided that the best place to see everything would be on the top seat, so, in accordance with this impression, and determination to get the worth of her money, she made her way right up under the canvass on the very top seat and in the most conspicuous place there was. She settled herself comfortably and was anxiously awaiting the grand entry of horses and riders, chariots, clowns, etc. This interested her very much and she was glad she had come. Finally, not long after the commence-

ment of the show, there was an exhibition given by a mind reader. He came out and the clown assisted in the demonstration. They put up a pole about six feet high and hung a heavy quilt over it. The mind reader sat on one side, blindfolded, the clown on the other. The clown had a deck of cards and pulled one out and held it up so the crowd could see it and asked the mind reader what it was. He said, "The deuce of spades." "That's correct," said the clown. Then they hung another quilt over the pole to satisfy the crowd that there was no possible chance for the mind reader to see what the clown had in his hands. Everything was ready. The audience was interested, and the old maid evinced the greatest consternation and surprise and manifested some little uneasiness. Another card was pulled out and held up and the mind reader was asked, "What's this?" He immediately replied, "That's the queen of diamonds." "Correct," the clown said once more and the crowd cheered. The old maid's eyes seemed to bulge out farther, and she exhibited some nervousness that attracted notice from those around her. Another quilt, a heavier one, was brought and hung over the pole, and the clown pulled out another card and said, "What's that?" The mind reader said, "The jack of clubs." "Right you are," said the clown. Again the crowd cheered and yelled, and on the old maid's face could be seen the picture of distress and fear. Another quilt was brought, heavier than all of them, and this was hung across the pole, and the experiment repeated with the same result. Another card held up and in that silent tent could be heard the clear, ringing coice of the clown as he said, "What's that?" In solemn tones the answer came from the mind reader, "That's the queen of hearts." Everybody said "Well done." A little commotion on the top seat attracted the attention of the crowd, and as they turned their faces in that direction, they saw the old maid scrambling over the seats and down the steps trying to reach the ground, her face the picture of despair and guilt. When she reached the ground and started out of the tent she said, "I'm going home; this place is no place for a woman where there's a man that can see through as many clothes as that

man can." I don't think this is a fit place for me to discuss questions where there is a man that can see through as many phases of it as your President and some others here can.

In a class in arithmetic, a teacher was trying to teach a boy to add, and it seemed a hard task to make it practical. She said, "Now suppose your father gave your mother \$20.00 and \$10.00 and \$5.00, what would she have?" The boy said she would have "A fit." A little farther along he said, "Suppose your father owes you a hundred dollars, and he agrees to pay you ten dollars a week. At the end of seven weeks how much would he owe you?" The boy said "A hundred dollars." The teacher said, "I'm afraid you don't know arithmetic very well." He said, "That may be so, but I know my father." I may not know all the scientific questions that enter into dairying, but I do know the dairymen and creamery men and the relation that should exist between them. I also know what dairying will do for a country; what it has done for Illinois, and what the dairy world owes—a Newman, a Gurler, a Cobb, a Collyer, a Sudendorf, and many other prominent exponents of this cause (citizens of Illinois), for the information received from them which has enabled them to advance more rapidly and receive greater remuneration. When Wisconsin failed to make both ends meet by raising grain; when Minnesota had wheat until their farms were mortgaged to 75 per cent of their value; when Nebraska was eaten up with grasshoppers; when Kansas was withered by the simoon winds from Texas; when Missouri wanted to make more money and quit raising tobacco, they all came to you for advice, and you started them to dairying by your example and by giving them your results, and today Wisconsin has 3,000 factories, a large proportion of it a cow for every inhabitant, and they are a happy and prosperous people; Minnesota has paid her mortgage and has money to loan; Nebraska furnishes the milk for a number of large creameries and with the co-operation of 400,000 Nebraska mortgage-lifters they are impervious to grasshoppers; Kansas has become independent and laughs at the hot winds, and Missouri boasts of the largest exclusive

creamery in the world, and yet I feel that in your own state the business is in its infancy.

Thirtieth anniversary, thirty years is a good long time, it is almost an ordinary lifetime. It's nearly a generation. It carries a man to a point of life where he should be competent to act on his own judgment, and it certainly puts a lady on the old maid's list. During a period of 30 years, thousands of people get out of the race. During the past 30 years many Dairy Associations have died, and yet, with all of this history to the contrary notwithstanding, your society is a strong, healthy, active and useful organization, and to its parents I would say tonight, you have reason to feel grateful for its existence and preservation as well as for the useful life it has had. I trust it would not be regarded as presumption for me to say to you that every drop of blood in its veins is of the purest character, and with each pulsation that sends it alternately to the heart and back again to the surface, it touches first a tender spot. The very soul of an industry that stands prominent and over which the special favor of an all-wise Creator seems to have ever been extended, and next, as it goes coursing through the system towards the surface, it is protected by a thin and sensitive skin. It's sensitive, it's delicate, it's flexible, it's susceptible, it's composed of sensitive people who deal with sensitive animals, who produce a delicate product. Keep around it your sustaining arm, give it your earnest and continuous support, supply it with the most wholesome and delicate food, provide it always with a comfortable and desirable abiding place, and, above everything, see that the air it breathes is pure, that the atmosphere in which it lives is uncontaminated, and you will live to see it grow larger and stronger and more useful. It will always be a power for good in the land of superior men, and you will be instrumental in making more popular than ever, this, the most profitable branch of the most dignified business in which man ever engaged. Did you ever stop to think that the first farmer was Adam? Did you ever think that when God Almighty Himself made this wonderful world, when He created this wonderful habitation of ours,

when He had completed it and pronounced it perfect, when He had finished this universe with its majestic mountains, its extensive plains, its towering trees, its rippling brooks, its noisy rivers, its placid lakes, its rough oceans, its dense forests, its innocent flowers—this beautiful piece of architecture and workmanship over which the inhabitants of the globe have gone into ecstasy for over six thousand years and have continually found something new to admire, when after these thousands of living creatures were created, when finally the climax was reached in the creation of man “In God’s own image,” a perfect creature—that he was a farmer and was placed on a farm? This is not all. Do you remember years after this, when God desired to recognize his children in a substantial manner for their obedience, or when He made them a promise of a rich reward for fidelity and compliance with His requests, in His desire to make this gift valuable, did He offer corner lots in some city, bank stock, mines or rich mineral, blocks of fine houses, droves of horses, or beef cattle? No! He offered them farms. That was the most valuable heritage He could give them, and I want to call your attention further to the fact that He made this proposition just as attractive as possible by not only promising farms, but promising dairy farms. That is the kind of farms God gave his chosen people, “A land of milk and honey.”

I am glad the time is past when the idea prevailed that a man who is unfit for anything else, can farm successfully, and I hope to see the day when the man’s tongue is forever paralyzed who takes delight in standing before an audience of students and holding out to them as the strongest inducement to be good and study hard, and possibly they may be governor or congressman or president. These are all good places and generally filled by good men, but I would have every boy’s, every young man’s and every old man’s highest ambition to be a good man, an obedient son, an affectionate brother, a true, loving husband, a just, patient, indulgent father, the very highest type of loyal, Christian American citizenship. Everybody can attain this, and who better than the boy on the farm, where the air is pure, where the moral

atmosphere has never been contaminated, and where the beautiful picture painted by Divinity in full and constant view of the occupant of the farm, has enlarged his soul and stamped upon his innocent face—Satisfied—the boy, the young man, full of ambition, full of a desire for more knowledge, who has not yet tasted of the bitter fruit of failure, who knows no limit to his strength, with his eye on the top of the ladder of fame, with an ambition that cannot be curbed, impelled by an active brain, that is furnished with good, rich, pure blood, on and on toward the goal that has never yet been reached, finds in the dairy business a field for thought, room for expansion, not the hope of reward, but the reward itself, in immediate results as he continues to get results that are financially satisfactory he is at the same time developing his mind and preparing himself for a higher degree of enjoyment.

It's because of your assistance in this direction that you (as a state) occupy the place you do in the hearts of the American people. It's because you've stamped upon every dairy farm in this country "Dignity." This is why the dairyman has sought a home in your domain; it's because you've established a market and paid the price that your dairy herds have been increased and your output made larger; it's because you have continued to meet and discuss the best means of obtaining satisfactory results that your people have accomplished so much and that the name of Illinois is synonymous with dairy products.

In conclusion, I want to say we are on the eve of a wonderful event, a stupendous show, an unheard of gathering. This demonstration just across the river is yours as well as ours, but I come to you tonight and in the name of three and one-half million Missourians I ask you to give us the last opportunity of the generation to return your hospitality of 1903. Let us be the hostess and you the visitor, and when you gather around our board and stick your feet under our table, we don't want to miss a single person—a member of your family. You have wondered sometimes how we were going to take care of you. I want to reassure you there will be no trouble on that score. Our

resources are inexhaustible. Let me relate a circumstance that occurred in St. Louis. I think it was in '73, at least there were two things very prominent that year, one was a money panic and the other was the prevalence of epizootic among horses. Some of you remember they had to stop some of the street cars in St. Louis and they used oxen to run their drays. In consequence of the panic thousands of men were thrown out of employment and with very many the question was serious. This particular case was a bookkeeper in a bank. He had been there for years. His salary was sufficient to keep his family in good style and he had used it up as is apt to be the case. When the force was cut down and he had lost his place he had nothing to live on. He had no relations to go to nor had his wife any relations to fall back on. It was a cold winter, fuel and provisions were to be bought, but he had no money, no credit, no trade and no apparent resources. He walked the streets day after day, calling on business men, but always with the same result—no place. He couldn't leave town, there was nothing to leave on. He dropped into D. A. January & Company's wholesale grocery house and with a look of determination on his face that could not be mistaken, he approached the manager, stated the case and emphasized the fact that he had to have work. The man told him that he had none. But he said "I must have work. I am willing to do anything." Finally the man said, "We need a man to drive a dray. Can you do that?" He said, "I never have, but I can learn; I have to work." He asked him "Can you drive oxen and can you swear?" The man replied, "I never have, but I can learn." He was told he could not drive oxen without swearing. So the deal was made and the man was told to come around in the morning and go to work. It is needless to say the man was on hand bright and early, with smiles all over his face. He was given his team which consisted of two yoke of not very well broken oxen, hitched to an immense big dray. He started in and got along very well until he got down on Second and Third streets. Some of you, possibly all, know how very narrow these streets are, and at the same time, the immense amount of busi-

ness done there. The streets were crowded. He tried to get through; then he tried to turn around. He didn't know which was "gee" and which was "haw." He would crack his whip and holler "gee" when he wanted them to go "haw," and "haw" when he wanted them to "gee." He had run into some teams and some teams had run into him. He had completely blocked the street and business was completely congested. You can imagine the frame of mind of teamsters on the street. He was very much excited and then he remembered what the manager told him, that he couldn't drive oxen without swearing. He he says, "This is the time, that's exactly what's needed to straighten this muss out," and in his loudest voice he said, "You are the by Goddest oxen I ever saw; you don't know 'gee' from 'haw' in spite of hell." St. Louis is full of this kind of men, and you need have no fears, as Superintendent of the Dairy Department for Missouri. I want to ask every dairyman of Illinois to come and see us. We want the opportunity of removing from your minds the idea that the principal product in our country is tobacco. I am told one of your farmers who had decided to raise his own tobacco wrote to our Experiment Station for seed, and after telling how much he wanted, he said he preferred Horseshoe, but if they did not have it he would take Battle Axe. We used to raise a large amount of tobacco, but we have changed.

A little girl got up in her papa's lap and said, "Papa who made me." He answered, "God made you." She then said "Who made you?" He said "God." She said immediately, "God is doing better work than He used to, ain't He?"

We are doing better work than we used to.

Illinois, superior men, Dairy Association, let me for a moment represent your state and in the name of your five million people, as well as in the name of the people of our state, in the name of the boys and girls, in the name of the agricultural interests of America, I plead with you to let the good work go on. Increase the monument you have laid the foundation of; extend it higher and inscribe more names with those already there. The eyes of the world are on you, and the question is

serious. When you render an account to your children, when you are ready to turn this country over to the next generation, when you shall render your final account as stewards, as trustees, as to the use you have made of your talents, and the whole country waits in breathless suspense to hear the verdict, let it be heard from ocean to ocean, "Well done." "Come up higher." I learned from listening to your very interesting exercises this afternoon that you have troubles sometimes, and possibly feel like letting everything go by the board. You are not the only case, you are not the first instance.

In the old country when two persons are engaged to be married, it is the custom to publish the names three times publicly in the church. In a certain parish there was a minister who took special interest in the general welfare of his congregation and a personal interest in each one individually, not only their spiritual welfare but their temporal as well. In this congregation was an estimable gentleman who was an old bachelor. One day he said to this man, "John, why don't you get married?" He told him he would be much happier and more useful as well and contribute to the happiness of some nice young lady. John says, "I guess that's right, and I would be perfectly willing to marry if I knew whom to marry." The minister said, "I'll tell you John who is just the person; there is Miss Mary (who, by the way was on the list of old maids and a member of the same church). She is an estimable young lady and a splendid house-keeper, with a splendid disposition and a sunny nature. Of all persons in the world she is the one." John says, "I guess that's right. She will suit me first rate and I guess you might as well publish the banns next Sunday." So according to instructions, on the following Sunday notice was given of the approaching marriage. You can imagine the consternation and surprise of Miss Mary, who was present, as this was the first intimation she had. She resolved that she would demand an explanation, but during the next week she did not see John, and on the following Sunday the notice was repeated. The banns were published a second time and Miss Mary listened with interest and apparent

bad humor. A few days later she met Mr. John on the street and she simply raised Cain. She stormed terribly. She wanted to know what in the world he meant and notified him that his impudence and assurance and presumption were unprecedented, and gave him to understand that she didn't approve of that way of doing business and wouldn't have it.

He took it all good naturedly, and in his mild, complacent way he apologized, saying he didn't mean any harm, he was sorry he had done it. He said it just happened that he was busy and didn't happen to see her or he would have spoken to her about it. But he said there was no harm done yet, as the banns had only been published twice, and rather than have any trouble about it, he said he would simply have the notice withdrawn and she need not give herself any further uneasiness as he would in this way make everything all right.

During this conversation, her anger seemed to abate and in a mild voice and sweet manner she said, "Oh, well, being as it has gone as far as it has, you might just as well let it go on."

I thank you.

By the President:—I guess Missouri is all right.

Song, by Miss Josephine Seawall—"The Waiting Heart."
Encored.—"If I Were a Rose."

By the President:—This afternoon we had a very pleasant message from Kansas and another from Missouri. It is only fair we come down to our own state now, and I am pleased to present the Hon. Lieut. Gov. Northcott.

ADDRESS.

By Lieut. Gov. Northcott, Greenville, Ill.

Mr. Presient, Members of the Dairy Association, Ladies and Gentlemen.

I hardly know just what subject to discuss. None of you who know me would expect an intelligent discussion of the dairy interest by me. I haven't, unfortunately, been in town during your session, or I expect I would be a first-class dairyman by this time.

It reminds me of a story of Joe Blackburn. He lived in Kentucky, and, by the way, have you ever heard the toast:

Here's to old Kentucky, with her deep and classic shades,
Filled with the youth and fairness of her dark-eyed maids;
Whose homes are filled with colonels,
And whose kernels are filled with corn.

Blackburn said when a young man he had occasion to run for the legislature. It was hard to get a crowd together with no railroad and no easy way of getting around. He heard of a hanging that was going to take place at a county seat and he asked the sheriff if he couldn't address the people who were at the execution. So Joe got ready, and asked the man if he had any dying request to make, and he said he hoped they would hang him first and let Joe Blackburn talk afterwards.

I don't know just what to discuss. Of course it is unnecessary to welcome you after you have been here for three days, for that has been done. I will tell you of a story on the Mayor, he talks so much about Greenville and they got tired of hearing him. He attended a meeting in East St. Louis and talked what a big place Greenville was. They say Ed had a dream the night before. He dreamt he was dead and in the other world and the man was showing him about. Ed looked around and said,

"Well, Greenville ain't so different from heaven after all." His escort told him, "Ed, you are not in heaven."

Mr. Marple was exceedingly kind in his compliments to Illinois and in his invitation for us to visit the great city of St. Louis during the world's fair. He said so many pleasant things, I won't tell a story on him.

I said I lived down in that part of Illinois near the gateway of St. Louis, the battle ground of the commercial traveler for St. Louis and Chicago. We have a saying when a man moved from Illinois to Missouri he bettered both states.

We are proud down in Egypt to welcome you milk men from Northern Illinois. We some of us have been up there and in Southern Wisconsin, where the land is so rich and fertile. If we had it down here we would sell it by the peck. What's prettier than Rock River and Fox River with its fair crystal water and the grass growing down to it on eather side, a magnificent country and a great people, a great industry, wonderful schools and churches. Coming down to Egypt we feel like as if we were not in it with you. Sometimes we feel we had not been blessed with all you are blessed with; sending your boys and girls from farms to the universities of the world. Yet after all, as Burns says, "A man's a man for all that." Down here in Southern Illinois—did you ever think what makes Egypt and how the boundary was formed. What is the boundary line? Because the town of Cairo is here, that is not it. In olden times there was a great drought and the people up north raised no corn. Then there was no Illinois north of Springfield before the '30 or '40s; they had to come down to Egypt to get corn, and they come on the old Vincennes trail. Today it is marked by the O. & M. railroad. A few people are ashamed of the name of Egypt and always say, "It is the next county south of us." Then they hunted for a living and wore coon skin caps and the untanned shoes. Steve T. Logan was one of them who ran about the streets of Springfield. He was the brightest of all Illinois lawyers. He had that slipshod way. He would go about Springfield with an old coon skin cap on and a plush coat that belonged

to his wife. Noble of St. Louis saw Logan dressed that way and asked what brought him so low. He was a cold blooded fellow, but he didn't know that Logan was worth nearly a million.

Down here in Egypt we have the best of everything, great men and women. We have an old-fashioned time of it. If one plays the violin, he calls it fiddling. When the war sounded there were not any better soldiers than those who followed old Black Jack Logan from Egypt. You must get acquainted with these people that come from the south. You know they have that idea of taking life easy. You thrifty people in northern Illinois do not understand this life; you are not going to see any more of it by going fast. They sit on a fence rail here and map out the destiny of the world; they pause in the cornfield and name the president. They are wonderful in that way, and though they may have no money in the bank, but they get so much out of life by living it from day to day. The more you mix with them the better they like you and you them. There never was a greater people than those living in this belt.

What makes a great people? It is not in the universities not in the moneymakers, but in the distribution of the means of livelihood. It is not that one man is rich, but many are comfortable. The laboring man has three square meals a day and his children are raised and sent to school. They are all strong and healthy and contented. It is this, sterling worth that goes to make up a great nation and a great people and the great American republic.

Ruskin says you never get anything out of life at half price. If you want to be strong you go to work; if you want to be wise you go to reading and thinking. If you want to be happy you go to love some one, and many a king has left his throne to find true happiness in the homes by the wayside. A man who lives with his family on a farm, with health and industry, as a means of livelihood, is in the happiest conditions that can come to them. No man is perfectly happy unless he lives much of his life outdoors.

I know a dairy man, and you all know him, Ex-Gov. Hoard of Wisconsin. There are three great conversationalists that I can remember in my time, Joe Blackburn, Dick Oglesby and Gov. Hoard, the three great conversationalists of this last hundred years as far as I know and have read.

I can't tell you many of Hoard's stories, but one day he went to his farm during an awful dry spell. "It's awful dry, Pat." "Yes," he says, "you have to soak them pigs to make them hold their swill."

An old German lady once said to him, "Governor, may the Lord take a liking to you, but not too soon."

Now, my friends, not to detain you any longer. I am sure that Greenville and Greenville people are most highly honored to have you meet in this little city. We have but lately begun to develop the milk interest of this country as it should be developed. We have many prominent farmers who are taking great interest in this matter. We have prominent dairymen in some of the counties like Mr. Lindley who have been active in developing the farms in this direction. The creameryman has come and southern Illinois is laying aside the impractical things and are going to fruit, hay and milk. We are raising those things which are adapted to this section. I believe that the future Egypt will be as great for its farming interests as it has been great in its splendid men, like Douglas, Lincoln and Logan.

By the President:—We feel repaid for coming to Egypt. We are a simple and common people up there, trying to work out out salvation in an earnest, honest way, and we have come down here to rub against you people and take back with us any ideas we can get. I hope they have learned something that will help them here, and if we are able to come again, I think we will all stand ready to do so.

The last piece of music on the program we will have now.

At 9:45 we shall have another session. The butter and machine rooms are open for inspection. Any that wish to ask questions you can do so, we shall be glad to have you.

Music by the orchestra.

Meeting stands adjourned until 9:45 Thursday morning.

THURSDAY, JANUARY 7, 1904.

Convention called to order by President.

Yesterday we had on the program Mr. Robert W. Pethybridge, so we will make a little change in the order. Mr. Cobb was to be on this afternoon with the records of his dairy cows, but we will listen to him now. Mr. Cobb is known better by the name of Bluff Jersey.

RECORD OF MY DAIRY COWS.

By E. N. Cobb, Monmouth, Ill

Mr. President, Co-Laborers: I was surprised a day or two ago when our friend Mr. Lindley was telling those stories, that he didn't finish up and tell all of them.

During that Domestic Science lobbying that was being done down there to Springfield, I went to the hotel and went into the wash room where the porters were and a couple of other fellows who were arguing as to who was more of a gentleman, Mr. Lindley or Judge Sherman. They were having quite a heated argument. One boy considered that Sherman was more of a gentleman than Lindley. I expect the boys had been tipped by Mr. Lindley and Judge Sherman and were judging their standing as gentlemen according to the size of the tip. Finally one of the boys says, "How do you know that Sherman is more of a gentleman than Lindley," but his reason didn't satisfy, and the other boy says, "Coming down in the car this morning a gentleman

and lady stood, and Sherman gave his seat to the lady, but two more ladies got on and Lindley gave his seat to two ladies."

We had with us last night our esteemed friend, Mr. Marple, of St. Joseph, Mo., who told how dairying was growing. I have a recollection of Missouri as a dairy state back in the early '90's when it was not so much of a success. I was called out there in 1891 to try and resurrect an old prominent creamery. The stockholders had put \$7,000 in it and were trying to get some of it back again. I had occasion to go out in the country there and look over the land to see what the chances were for getting some milk, and one day while riding along, I saw a good looking cow. I went in to see how the people felt about dairying. A lady came to the door, and I asked her if they were dairying. "Well," she said, "We have been, but my man says he has made up his mind it did not pay," and they had tied the cow to the straw stack. The cow looked like a fair milker. I asked what they were going to do with the cow, said the cow was going to suck herself and when she got fat they were going to sell her to the butcher.

For the feed question, Shilling is here from Iowa Dairy Association, and while he is not a dairyman himself, he keeps a cow and they told me at the dairy meetings this fall he also keeps a rawhide whip in the barn and has whipped cream when you want it.

Since I have been here the last three days and watching, I have modified what I intended to say somewhat. I would like to call your attention—you people that have as you say been dairying perhaps three years—to the quantities of figures that have been presented to you in the last three days. Those charts represent thousand upon thousand of dollars to present those figures to you; they represent years and years of research and experiment. You are in a position to avoid all of the mistakes that veteran dairymen of Illinois made. For one cent, a postal card sent to the University, you can get bulletins that have taken years to bring up to the point they now are and you can avoid all the mistakes, and grasp all the things that make dairying a success.

Five years ago I learned in about five minutes more about a certain subject that is costing Illinois millions of dollars—avoiding smut in oats.

Now the record of my dairy herd. I can't help but call your attention to the fact that it would have been impossible for me as an individual to have built up a herd that I have built up without the co-operation of my family. Without the system we have adopted, and the class of cattle that we have striven to breed it would have been impossible for me to have done what I have with hired help.

I was manager for some years to dairies throughout the country and depended upon hired help for attending the cows, and I learned from experience that it was impossible to reach the highest attainment in dairying with the hired help that we have. You take a young man that is skilled enough to assist in handling high class dairy cattle, and he is a man that you are not going to keep very long, he is going to do something for himself. If he has skill enough to handle high class dairy cattle, he has got skill to go on farther.

I have found that the highest attainment in perfection of dairy animals require that you breed your animals, and in a very brief way, I will describe our methods of raising our dairy animals.

In the first place, we keep an accurate record of every individual cow in the barn. Not only do we keep an accurate record, but we know, by testing her milk from time to time, once in two weeks or a month, what her butter fat production is a day, a week, or a year, and these cows, in connection with the milk sheets, we can either send to the butcher or raise their heifer calves as the case may be. All of our best cows are treated in this way, and we have all that make in profit and we have raised the heifers from them.

In the matter of sires, we have never let our judgment select young animals. What I mean by that, we never buy young animals. We always make it a rule to study the herds in the country and visit these herds and see the kind of heifers they

have in milk and by males that have been tested, so that in buying males, we have no experiment. We know the records of these animals, and we know that with the class of cows that we have, we are bound to get results.

In rearing calves, if accurate rules and regulations are not observed with young cattle, all our work is in vain. The most critical time is from the time she is born until she is two years old, after that she can, in a way, take care of herself; before that, she cannot.

My son, who is head manager, has reared 71 or 75 Jerseys that we have in our herd today. There never has been any one else that gave these calves a feed of milk. Think of that for a record for a young man. For six or seven years, since 1898 there has never been a calf fed in our barn unless my son fed it or was at the feeding place when those calves were fed. He has been assisted by some of the young ladies of the family in feeding those calves, but been right there every time. He has his scales and his thermometer, his individual stalls for each calf and they are all fed by weight, and the temperature is the same at all times. These calves are fed on whole milk for two weeks, or perhaps a little longer according to their physical condition and according to their size and strength. Then there is a pound of skim milk added to that ration and a pound of whole milk taken away, and finally they are put in full feed of skim milk. When this occurs, during the time the change is being made, some feed is put in their mangers after the pail is taken away. He uses galvanized pails and they are scalded each time. That one thing alone has caused more deaths to more calves than any other thing. Filthy milk pails that the calves are fed from I mean. You should use galvanized pails and scald them carefully each time. After milk pail is taken away, the calves are fed sole grain ration, oats or something of that kind, rich in fat and protein and in a very short time they commence to lick up the feed in their mangers.

Here is another thing, be very careful to not allow the calves to suck each others ears for that is a great source of loss.

Calves to have good digestion should not be allowed to do this as it retards their growth. Every day of the calf's life, from the time it is born until two years old and fresh, it is never allowed to go hungry at all. They are forced to grow; we don't give them a ration that fattens them, but provides them thoroughly with feed every day and year.

As soon as the young heifers come into the milk barn, or about two weeks before fresh, they go through their preliminary schooling for milk cows. Udders are handled and teats anointed with vaseline every day, and the attendant who is going to milk those heifers handles them and no one else. By the time we freshen them, they do not know any different that to be milked at once, and they do not object; we don't break heifers, no such term used.

The cows and the heifers are fed carefully, and my son who feeds the calves, feeds the heifers and being well acquainted with those animals from birth, he knows them as individuals and feeds them up to their capacity. When I use that phrase, I do not mean that we gorge our cattle. I mean the limit of capacity, what an animal will digest and pay for and gives a profit. The milk cows are never allowed to want for green feed twelve months in the year. If pasture becomes useless in summer, we resort to silo or soil crops. Peas and oats we feed after blue grass becomes tough.

The peas you raise in this country are a splendid feed and better peas than the Canada peas. I will just mention putting some peas on the corn stubble and then put on the plow and plow under about four inches deep. And then put on about forty pounds of oats with them. But in one bushel of peas to forty pounds of oats. By the 10th day of June you should have a crop or perhaps the 1st day of June, depends on the soil. The crop with us will make from eight to twelve tons per acre, and it is a grand good soil restorer. For our next soiling crops we go to our corns. Peas and oats will last until 20th or 25th of June and what you have left will make first-class hay. Then you take your crop of corn for a soiling crop and then comes millet and sorghum

and sweet corn, after that to field corn and sorghum. We raise sorghum and sweet corn and field corn.

It is hardly worth while to say anything about ensilage. In 1891 we had a silo full of ensilage. That was the memorable drought year. We turned our cows out on blue grass pasture and they were giving 720 pounds of milk at that time. Within ten days the yield had dropped down to 640 pounds on blue grass. We turned to ensilage and continued throughout the summer on that. I have a record for milk for that summer. I have shown it at the different dairy meetings in this state and in Kansas, Missouri and Farmers' Institutes and they all say it is a very remarkable yield for uniformity.

I have here one of the original total yields of milk per day for that heated period. From May 6th to the 31st day of August I think it is. It shows the remarkable uniformity of milk yield.

In connection with this matter just at present, the test of corn fodder fresh from the field, which is a splendid field, and ensilage. And it is ensilage that is more digestible than green corn.

I have here some individual records. I got home Saturday night and came away Monday morning, and I had not the time to attend to the correspondence waiting me, and other matters to attend to, and did not have time to get all the records of the cows. I did not pick out the poorest cows in the herd, and I will show you also I did not pick out all of the best cows. The boys ran over the records and they found that we hadn't a cow, a mature cow with a second calf that yields less than 5,000 pounds of milk, and the Babcock test and record sheets never falls below 5 per cent average test.

We have here Lou. She has Shorthorn blood in her veins. She in 10 months, produces 5,460 pounds, 4.8 per cent fat in milk.

Dot is a very remarkable heifer, when two years old. When three years old she gave 5.4 per cent fat in milk, and her own weight in milk.

Q:—What does she weigh?

A:—First period 450 pounds, next period something over 600 pounds.

Dot here has nine months record and produced 5,554 milk, 343.90 pounds finished butter.

Trilby has a history, in fact all our cows have histories. The first year that I took charge of this herd of cattle, a gentleman came to me and said he had a Jersey heifer, a yearling, and wanted to sell her. He wanted a cow that would produce a \$20.00 calf, so I went and looked at her and bought her for \$35.00. He told a neighbor that "That Cobb was a sucker, he gave me \$35.00 for that heifer." The first time Trilby was fresh she made a record of 14 pounds butter in 7 days. A year's record was \$104.00 worth of butter at wholesale prices. We sold our butter at wholesale.

Q:—What price?

A:—25 cents a pound.

We had the skim milk left and heifer calf outside of this, and my friend I bought her from had a \$20.00 calf left.

Trilby has a record as a four year old of 10 months, 7,648 pounds milk testing 5 per cent, 430.76 pounds of butter against a \$20.00 calf.

Aggie has figures here for 7 months 4.9 per cent fat, 4,355 pounds milk, 249 pounds butter, and Aggie was giving 21 pounds of milk and it takes 15 pounds of her milk to make a pound of butter.

Dollie made 15 pounds of butter in 7 days for us as a four year old. We have had her for 10 months. In that 10 months she made 9,775 pounds milk testing 5.2 per cent fat, 594.54 pounds butter. Mr. Latimer raised this cow to a yearling, which doesn't seem to have hurt the cow's record at all.

Magnolia has been giving 17 pounds milk daily in January, and tested 5 per cent, gave 5,540 pounds in 8 months and 310½ pounds butter.

Fay is still giving milk 10 months 6,008 pounds milk, 366.18 pounds butter. Why I say butter so much is because I expect to get cows after a while to make more.

Name.	When. Lb. Milk				Fresh.				Apr. May. Jne. July. Aug. Sep.				Oct. Nov. Dec. Jan.				Fat, Butter,	
	Jan.				Feb. Mch.												%. Total. lb	
Bell Turbigo.	12-25-02	31	25.8	21	19	25	24.8	22	15	19	16	30 lb.	14.8	12	10	5.2	7001	418.60
												9 days.						
Lou	10-24-02	22	20	18	15	19	18	18	14	13	10	9 days.	28	24		4.8	5460	301.38
Dot	2-28-02		28	28	27	26.8	26	25	17	16	11	5	0	0	..	5.4	5554	343.90
			11															
Trilby	3-28-02		38	39	39	40	38	34	25	25	19	14	7	0		5.0	7648	439.76
								5-0										
Aggie	7-25-03							25	26	24	24	23	23	21		4.9	4355	249.38
Dollie	3- 3-03		39	38.8	39	37.8	34	33.8	30	26	23	14	11			5.2	9775	584.54
						9-0												
Magnolia	6-22-03						34.8	35	29	29	22	20	18	17		5.0	5400	310.50
					11-0													
Fay	3-20-03		28	30	31	28	23	22	19	15	12	10	5.3	6008		366.18		
							20-0											
Kings B.	9-13-02						33.8	33	28	28	28	28	5.5	4180		264.28		
			16-0															
Lady	2-16-03	28	29	25.8	30	31	31	24.8	24	20	16.8	12	10	4.8	7103	519		

Kings B. we only have had her five months. Is giving 28 pounds of milk a day. So far 4,180 pounds milk, and 264.38 pounds butter in 5 months.

Lady is a cow with a record. She was born on Missionary Ridge and is a granddaughter of old King Koffee, 10 pounds milk a day, yearly record of 7,104 pounds milk, 376 pounds butter.

These records have been made without forcing, only giving those cows what they would handle well. At no time during the time this record was made have they ever received 10 pounds of concentrated feed.

I have finished, and I presume you may want to ask some questions. I will state here, I have had my book published last fall that has everything in I have stated. I will answer any questions.

DISCUSSION.

Q:—Your boys have heifers drop calves at two years old?

A:—Yes sir, if well developed. Not if they show tendency to be small and not up to standard.

Q:—As an average?

A:—Yes sir, fresh at 24 to 25 months of age.

Q:—What do you think of ensilage as feed?

A:—Well, it is just this way with me, if I could not have ensilage for horses, cows and pigs, I would not have animals on the farm, and not have the farm. Could not afford to be without it for a moment.

Q:—No time in the time you have had your herd had less than 5 per cent.

A:—Never go below 5 per cent.

Q:—Do your cows come in mostly the same time?

A:—They come in every month in the year, we always have fresh stock.

Q:—Not many fresh at any one time?

A:—No sir, probably 3, 4 or 5.

Q:—For not having many of them fresh at one time that is a remarkable test?

A:—Our milk supply is very uniform indeed. It does not vary 100 or 150 pounds a year. We are very glad to have the fresh cows in the herd all of the time. I would not care if we had a fresh cow every week of the year.

Q:—You have got from 7 to 11 tons of peas and hay with oats on the ground?

A:—That's in the green state. It will make from 2 to 4 tons of pure hay.

Q:—Hills how high?

A:—Three to four feet high.

Q:—What kind of pea?

A:—Canada pea, I don't think that will grow down here.

Q:—I have heard they do well?

A:—Yes, they do well, they are a good pea. With the southern pea, if they do well, you have the situation in your own hands, that will just lap over on to your field peas.

Q:—They want something to lap over?

A:—Yes sir.

Q:—What did you plant?

A:—One bushel of peas to 40 pounds of oats.

Q:—How did you sow them?

A:—Broadcast.

Q:—On rich soil?

A:—On soil that produces 40 or 50 bushels of corn to the acre.

Q:—How many tons of ensilage to the acre?

A:—Two years ago, I took Mr. Newman into a field of ensilage that were just head high, 22 tons to the acre, 900 pounds ensilage to feed a cow a month. Now its probably very easy to figure out how long that acre of sorghum would last. I went through our corn field and made an estimate by selecting average hills and that a cornfield of ensilage made 19 tons per acre. Ordinarily it will make from 10 to 15 tons. Down here probably make 6 or 8 tons.

Q:—What kind of a silo?

A:—I have a model here that for practicability and cheap-

Department of Dairy Husbandry, College of Agriculture,
University of Illinois.



J. W. HART, Manufactures
A. J. GLOVER, Field Work
H. A. HOPPER

E. DAVENPORT, Dean

C. E. LEE, Manufactures
W. J. FRASER, Chief
C. C. HAYDEN

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ness its equal can't be found. There are all kinds, and it is a matter of a man's pocketbook and location as to what kind of a silo he should build. A man told me he had no money and I told him to dig a pit and he has been using that ever since with perfect success. A man just below St. Louis has built one the same way. I think he must be this side of the river, for he said he had no money.

Q:—You would advocate ensilage in this condensing district and do away with the condensing factories?

A:—No sir.

Q:—You said you wouldn't try to run a farm without it?

A:—I would not stop a condensor, I would stop myself. I would like to hear from Mr. Spies on that matter. He gave personal experience in this condense matter.

By the President:—We are crowded this morning for time. I will have to ask Mr. Cobb to keep to his subject as close as he can.

Q:—Do you let those calves suck?

A:—Not the first time. Our cows never mourn for their calves, they don't know a thing about fretting for their calves.

Q:—Do you keep any cows in the barn such weather as this?

A:—Turn the cows out about 8 or 9 o'clock. Have a tight board fence on the west side of the yard and 100 feet of barn and silos on the north, and they run about until usually 2 or 3 and then put back in the barn.

Q:—How many times a day do you feed?

A:—Three times a day feed roughage three times a day.

Q:—How much do you estimate it costs you to keep your cows per year?

A:—It costs us about \$35.00 a year, milk costing 56.1 per 100 to produce.

Q:—How much cost a day to feed a cow now?

A:—It costs us 8 cents for grain at the present time.

Q:—How many pounds a day?

A:—The best cow 8 pounds grain a day. That is not taking

into consideration the grain in their silage. We have no corn ensilage only clear sorghum.

Q:—What else do you feed?

A:—Feeding millet hay.

Q:—No clover?

A:—No sir, no clover.

Q:—What grain ration are you using?

A:—Cotton seed meal and corn meal until this week. Boys are going to have half oats and corn meal ground together and feed 3 pounds cotton seed meal and—

Q:—Not feeding bran?

A:—No sir, can't afford it. You people down here you get the cheapest source of protein in Illinois today in your oil meal and in connection with your dry feeds and the best source of concentrated feed.

Q:—Providing you don't feed too much?

A:—Yes sir, the protein content of your oil meal is not costing you over four cents.

Q:—How many cows in your herd?

A:—Thirty cows in milk.

Q:—And how many acres?

A:—We have a lot 75.

Q:—How many acres do you supply that herd from?

A:—Well, I can't tell you. Three years ago we had 110 Jerseys and we had 110 acres available land and kept 10 horses and raised 100 pigs, but since that time it has been reduced. We have 75 now and cut 26 acres of sorghum and corn, shelling 10 acres of corn and putting sorghum in the silo and it will be more than the cattle will eat.

Q:—What do you estimate the interest that brings you on your land that you have been cultivating?

A:—I have not figured that up, but that land is being held at \$100 an acre. We are selling \$6,000 worth of products from that farm in a year.

Q:—Does it all go into dairy products?

A:—No sir, \$1,500 worth of hogs, that is dairy product

really. And we sell a good deal of other stuff from the farm as well.

Q:—According to your figures here the farm would not pay over five and a half per cent.

A:—It is low I never figured it.

Q:—That wouldn't reach over $5\frac{1}{2}$ per cent.

A:—It is like the lead pencil you spoke about. We are farming 30 acres of land a year. When we went there five years ago if we got 30 bushels corn to the acre we thought we were doing well, now we are getting 75.

Q:—How ripe is your sorghum before you cut it?

A:—A week before fit to shock is our rule, when thoroughly hard and formed ears in the field 3 three inches of dry husk on the outside.

Q:—How do you raise your calves, how long and what do you feed?

A:—Six months. Whole milk two weeks and skim, six months.

Q:—We think down here we can't do without bran, and our experience is, when we drop bran we drop in milk. I don't care what you feed you drop in milk when we quit feeding bran?

A:—I can't understand that. Bran is a good feed if we could only buy it, worth the money, but impossible to feed 18 and 20 dollar bran to cows.

A Member:—It costs here as much as 89 cents and \$1.00 I think. The cattle always have responded to me on oil meal.

A Member:—Never been able to milk successfully here without bran.

Mr. Mason:—In regard to the per cent a man can make. In our section the dairy farms are largely rented. There is a banker there that rents a farm, 240 acres on halves. He furnishes the cattle, and the renter furnishes the tools and the team. Each one pays half of all grain bought, and each one has half of all stock raised, and his farm of 240 acres, after the taxes and all expenses was paid, and the renter done all the work, the banker received \$2,400 for his share of the rent of the farm

without a silo. Done in the way that makes the best milk that's made on earth. It will go in any market. That is what has been done in the Elgin district. Sold milk at condenser.

By the President:—I have seen one or two farms around here and as far as I can see you can do the same.

Mr. Mason:—I don't see why you can't. Think these farms right here, if not too large, and were well stocked, I can't see no reason why this land should not double in price from what they are asking now for it, by running dairy business in proper methods. You got the markets here and right at St. Louis, the same position our dairies are to Chicago, and got condense factory too. You got opportunities here for dairing and that is what will bring up this land and it ought to reach \$80.00 or \$100 an acre.

Mr. Glover:—At the present price of bran, it is worth that for a fertilizer for farms.

Mr. Lindley:—Mr. Mason took a drive out in this country with me and every man that takes a ride says the same thing. Cobb would too.

Mr. Newman:—I would suggest you hold Mr. Cobb here a day and take him out.

Q to Mr. Mason:—You always feed bran?

A:—Yes sir, I do.

Q:—Can't you do without it?

A:—Would not run a dairy without bran. Cows never come into the barn that there is not some bran in the manger.

Q:—What do you pay?

A:—\$15.00 now. When they are eating this bran, they are making me a good investment.

Q:—Where do you get your bran?

A:—That by the car load, comes from Minneapolis.

Q:—What is the difference between winter bran and bran from the wheat up north?

A:—I could not answer that.

Mr. Newman:—Mason said he would not be without bran if he had to pay \$20.00 for it.

Mr. Whitney:—Up in Michigan we never get bran for less than \$17.00 and from that up to \$21.00 a ton. We always feed it up there and consider it a good investment even at that price.

By the President:—Before proceeding to the election of officers, I want to give Mr. Lee, of the University three minutes. He made a statement yesterday in answer to a question, which I am sure sent a wrong impression concerning the hand separator question, and I want to give him a chance to make himself plain.

Mr. Lee:—I made the statement regarding hand separators coming into this country to stop, and I said "I hope not long." I should have explained myself. I am not a person that objects to the hand separator system. What I objected to was the sanitary condition of it. There should be better care of our goods and it should be brought to our factories in better shape. The cream should be kept clean. The hand separator is doing a good thing for the country. If it were not for the hand separator the dairy industry would not be where it is today. I object from the standpoint of not taking better care of them and agents misrepresenting the way they should be taken care of. The hand separators are doing good work, but they must be kept clean. I hope this explanation will make my meaning plain.

THURSDAY AFTERNOON SESSION

Meeting called to order for the afternoon session by the President. If the Committee on Resolutions is ready to report we will hear from that committee as the first item of business.

RESOLUTIONS.

Read by Mr. Geo. Caven, Secretary.

Whereas, The National Dairy Union is an organization for the protection and advancement of the dairy industry through legislation and

Whereas, In the passing of the oleomargarine law that became effective July 1, 1902, the industry has been greatly benefitted. The Chicago market is a conspicuous example of the results of the law. There local consumptive demand has about doubled as a result of the operation of this law in the stopping of the fraudulent selling of oleomargarine as butter. This same benefit has been felt in other markets and the law has been a direct benefit to the whole industry. Had it not been for the larger consumption of butter, the very large production of milk during the year just closed would have lowered to a considerable extent, the prices of all milk products.

Whereas, The National Dairy Union is supported by the contributions of dairymen and dairy factorymen and others interested in dairying.

Resolved, That we bespeak and urge for it the support of all Illinois dairymen. In the publication of the Creamery Patrons Handbook, the National Dairy Union has produced an authority on dairying that should be in the hands of every keeper of cows, whether he patronizes a creamery, conducts his own dairy or sells his milk. In paying the one dollar asked for the book, you secure membership in the National Dairy Union, help along the work of protecting and advancing the dairy industry, and at the same time you secure a book that contains an education in dairying.

Whereas, The dairy interests of Illinois are of such importance, representing as they do over \$30,000,000 and ranking second in all agricultural interests of the state, and

Whereas, Any agricultural exhibit at the Louisiana Exposition would be sadly deficient without a proper representation of this great industry, therefore

Resolved, That we urge the State Louisiana Exposition Committee to make a suitable appropriation of their funds, of at least \$15,000 that this great and growing interest of the state may make a suitable display at the coming exposition, and further

Resolved, That in order that the display be made in the most creditable manner, the state commission allow a committee composed of two members from each of the great dairy organizations of the state, viz., Illinois Dairymen's Association, the Chicago Butter Board and the Elgin Board of Trade and A. J. Glover of State Agricultural College faculty, to have direct charge of the exposition display, and of the expenditure of the funds, subject to the approval of the state commission, and further,

Resolved, That owing to the short interval intervening before the time of the display, we do respectfully pray the state commission to act promptly in this matter, and earnestly urge the officers and each member of this Association to use all honorable means to secure the prompt and favorable action by the Commission.

Whereas, Results have demonstrated the great benefits accruing not only to the farmer and the creamery interests in those sections where the dairy field experts have been sent by the Agricultural College, but also to the public which consumes the dairy products, and

Whereas, The central and southern sections of the state are in need of a further extension of this field work, therefore

Resolved, That we commend the action of the Agricultural College of adding to the present force of field experts, and further

Resolved, That we earnestly urge the College of Agriculture, that the increased funds secured from the last legislature be used to increase the present field force, and extend the field work to all sections of the state, this being the purpose for which the increased appropriation was made.

Resolved, That we recognize the Hon. James Wilson, Secretary of Agriculture, and the Dairy Division of his department as true friends of the dairy interests of the whole country. We thank them for their fairness in the enforcement of the dairy laws and extend our hearty cooperation and support. We wish also to thank the Secretary and the dairy division for the presence at this meeting of W. D. Collyer, inspector of dairy products for this district, and thank Mr. Collyer for his services in judging the butter exhibit at this convention.

Resolved, That we thank the Hon. Leslie M. Shaw, Secretary of the Treasury, and Hon. J. W. Yerkes, Internal Revenue Commission for the fearless manner in which they are enforcing the laws regarding imitation products, which are of so much interest to the dairy industry.

Whereas, The Greenville local committee in its work for the success of this convention, has made a new record of effort as shown in the good attendance the result of that work, therefore

Resolved, That we thank the citizens for their work and their welcome. They have all had the success of the convention at heart and have labored to make it so.

We also thank the newspapers of Greenville. Their editors have kept the convention before the readers and urged them to attend the sessions. Their help and other papers of this section have been powerful influences in making this convention a success.

We wish to thank the hotels here for their successful efforts to accommodate the members of this Association and the citizens who have offered to open their homes so that no one would lack comfortable sleeping rooms.

We, as an association, are well pleased with the meeting here and hope the citizens of Greenville and surrounding territory are as well satisfied and will realize to the fullest measure the benefit of this gathering.

Resolved, That we extend our congratulations to the milk producers of Bond County, the Helvetia Condensed Milk Co. and the Greenville Condensary on the magnificent business their co-

operative efforts have established in the last few years, and express our best wishes for its further extension and continued prosperity.

Resolved, That we endorse the establishment of a correspondence school as a department of the College of Agriculture of the University of Illinois as outlined by President Newman in his address.

Whereas, The State Board of Agriculture has erected on the State Fair Grounds a new dairy building, and that at the last fair a number of dealers in tin can separators and lightning churns were allowed to occupy space in the said building to the detriment of the dairy business as a whole, therefore be it

Resolved, That we, the State Dairymen's Association desire to place on record our appreciation of the action of the State Board of Agriculture in providing such splendid accommodations for the dairymen of the state, and do hereby respectfully petition the Board to allow no apparatus of a swindling nature in the building or on the grounds in the future.

Whereas, There have been in years past immoral and fake shows on the grounds of the State Fair, and that such exhibitions are very demoralizing, especially to the young, and are a disgrace to the state, therefore be it

Resolved, By the State Dairymen's Association is convention assembled, hereby request the State Board of Agriculture to rigidly exclude all such degrading exhibitions in the future.

Resolved, That we reassert our interest in the good roads movement. In this southern part of the state the need of hard roads is particularly urgent. We request our senators and congressmen to interest themselves actively in the good roads movement and to support the Brownlow Bill now before the national legislative body.

Resolved, That we commend the work being done by the Illinois Buttermakers' Association, an organization of women in the central part of the state, who are spreading the knowledge of correct dairy methods and good dairy products.

Resolved, That we thank the State Farmers' Institute for

providing for a dairy display and demonstration at the next annual meeting of the institute to be held in Decatur, February-ary 23-25. This display and demonstration is to be under the direction of A. J. Glover of the State College of Agriculture and Mrs. H. P. Purviance, the President of the State Buttermakers' Association.

Geo. Caven,
H. T. Thurston,
C. J. Lindley,
A. B. Hostetter,
G. H. Gurler.

By the President:—How will you take these resolutions up, singly or as a whole?

Mr. Lindley:—I move the adoption of the resolutions as read.

Any questions?

Q:—Just one, I would like to know just what the Brownlow Bill is in Congress.

A:—I can read the bill.

In brief, it requests government aid in building of road, an appropriation of a certain amount to be apportioned among the states, but any state, or any section of a state only gets in proportion to the amount of money it raises itself. In order to get a part of this government appropriation a certain section has got to raise a certain amount of money itself, and then the object of the bill is to provide that section with the amount as stated, and thus bring the government in as an aid in the construction of good roads.

By the President:—Any more questions?

If not, all in favor, say "I." Contrary. None.

They are carried as read.

Mr. Lindley:—I move the Secretary be instructed to send to each Congressman and Senator a copy of the resolutions regarding hard roads.

It is moved and seconded. All in favor say "I."

Contrary. None. Carried.

By the President:—Any further motion in regard to the resolutions?

Then we will pass on to other business.

By the President:—We have with us Mr. A. L. Haecker of the Dairy Husbandry Department of Nebraska Experimental Station. Mr. Haecker is the son of Prof. Haecker and who is now chief at Minnesota Station. We shall all be pleased to hear from Mr. Haecker.

DAIRYING AND OTHER FARMING.

By A. L. Haecker, University of Nebraska.

Mr. President, Ladies and Gentlemen of the Association.

This is the first time I have had the pleasure of meeting with an Illinois crowd or committee of dairymen, and so I look upon this as a new experience for me and something of some value. I hope that I can be of value to you.

My subject is a little bit dry. I chose this subject for one thing, I never saw anything discussed along this line and I thought it would be a good thing to introduce; and for another reason, I was told this country had recently gone into the dairy business rather strong, that you were going in still farther and that it had been a new departure.

The subject as I wished it, was not "Dairying and other Farming," but "Dairying With Other Farming."

Someone has suggested to me that as we have met from several states, that it would be a pretty good plan to say what we are doing in Nebraska if you would like to hear, or if you are particularly interested in what we are doing, I shall be glad to tell you of some of the things.

We are a pretty large country, and each section has a different way of carrying on this industry. I thought if you so

wished that I would devote some time before I read my paper to the subject of dairying in Nebraska.

The dairy conditions in Nebraska are very peculiar, different from any thing east of the Missouri river. West of it there is a similarity. For example, we have passed through three very marked periods of development. From the old shallow pan and dash churn to the gathered cream creamery, made possible through the introduction of the deep cooling can and then to the whole milk creamery by the invention of the centrifugal separator which revolutionized dairying all over the world. We took up the creamery system and we now have it all over the country. That is where a dairyman brings in milk to a central place where it is skimmed and the cream made into butter on the factory plan. In Nebraska it was possible to establish 40 or 50 creameries on this plan. We had a hard time for we lived further apart, larger farms and not too many are in the dairy business. We didn't have quite as many milch cows, and what we did have were not very good. So that it took a large territory to supply this plant, and so I say we got along with great difficulty.

About 120 or 130 skimming stations were built in Nebraska. What did it do? It brought relief to a struggling home dairy country. I have been in parts of Nebraska where butter was sold for 6 and 7 cents a pound and they had a regular currency of their own, by tags and chips of 5, 10, 15, 20 or 50 cents. Butter was brought in and exchanged for this money.

Nebraska is only 400 miles long, and when we talk of Nebraska, we are talking about a state that has a great deal of difficulty not alone in its climate, but in general methods and tendencies of farming.

In the western part of Nebraska it is different sloping toward the east. It rises from an elevation of 1,000 to nearly 6,000 feet, or nearly a mile. Here in this slope one end is set up a mile high. From the eastern edge of the state you can travel westward and every mile you go toward the west you get a climate that has less and less rain fall. The rain fall is reduced the

farther you go west. It is natural then that there is a difference in the methods of farming and general husbandry.

What about these skimming stations? They were established all along the lines of the railroad, and instead of the farmers selling butter for 5 and 10 cents, they got 18 cents for butter fat. Hauling milk 6, 7, 8 and 10 miles over the hills went against the grain and gradually they began to drop out. Something had to be done. Something was done. I will give the people in Nebraska credit for this. When they see anything that is all right and will apply to their conditions, they are very quick to take it up. I know of no people who are so quick to introduce a new thing. They can change their politics in Nebraska and in Kansas too.

In Nebraska we find the hand separator all right. It applies to our conditions. It reduced the long and heavy haul. It gave us a concentrated produce that could be marketed wherever a train stopped. That did not exist before. It returned, on the other hand a very valuable rearing material, and you know we are very much inclined to raise cattle and hogs in that state.

Just let me show you how this hand separator was introduced. About six years ago I took a census of the state. We have about 600 or 700 hand separators in the state. Webster, who was detailed by the government to inspect the dairy system, the hand separator system in the west, told me he had taken actual figures from the creamery companies and separator companies, and he said it was very safe to say Nebraska had now 18,000 hand separators. In other words, in the last five years, there has been brought about 17,000 hand separators into the state. That was changing a system awful quick, and making a whole lot of difference in the method of farming.

Nebraska today is a cream producing state. We don't even show butter at dairy associations. We have nothing to show in particular. It is all made by a few concerns. The dairy industry of the state is carried on in cream producing plan. Now, as to whether that is all right or not, I don't wish to discuss. I maintain this, that the survival of the fittest is a very important

and good law. When a great nation of people find they want a certain thing, and it comes in all right with their methods, it must be all right. I don't believe in pushing water up hill. It would be absurd to talk cheese produce to you dairymen here, the same as it would be to talk creamery on the old plan in my state, so we can meet on a mutual ground.

What about it? Are our farmers doing well; are they increasing their business? I can tell you they are. The increased production is something enormous. They have found out it is very easy to produce a can or so of cream a day, that it is very little additional expense, and it means money right straight along every week for groceries, etc., etc.

Everywhere you see they are increasing their productions. Another thing that helps us out is the cheapness of cow feed. Some one was talking here today about bran being \$15 and \$18 we buy it for \$10. We have alfalfa hay, the very nicest, as green as grass and as sweet as honey for 3, 4 and 5 dollars a ton. It is richer than clover and abundant everywhere; beets in great quantities and corn everywhere. Wild hay \$2 and \$3 a ton, a climate that is almost unbroken of steady sunshine, so you see it does not cost us only from \$18 to \$20 to feed a cow and feed her well, in the western part only four and five dollars a year. The cost of produce is lowered more in proportion than the extra freight charges for being distant from market. We are shipping an awful lot west instead of east. The time will come very soon when nearly all our products will go west instead of east. There is a great market opening up over on the coast of Japan. It may be some of you will stray over across the Missouri and get in that country like you have come here. It might be you have too many boys, and I want to tell you now that you can feel perfectly sure and perfectly safe that if your sons or your neighbors go into Nebraska with the intention of carrying on the dairy business, they can do it very successfully and make plenty of money. They will want to continue.

It was through a mistake that the subject of my paper was

given in the program as "Dairying and Other Farming," for it should have been "Dairying With Other Farming."

The subject seems to be of some importance when I am reminded that about nine-tenths of the milk produced in this country is from farms where mixed farming is practiced. This is perhaps a condition which we as special dairymen are somewhat averse to as we would rather see the dairy business carried on as a more special branch of farming.

The fact, however, remains that diversified, or mixed farming, is the prevailing tendency of the majority of farmers. It is only here and there we find a dairyman who will even admit that his principle business is in the line of milk and butter production. The great mass of milk producing stock in this country is made up of grade or native cattle. Then the conditions we naturally confront are, first of all, that the milk is produced by grade or common cattle, and by farmers who are engaged in several branches of farming. This condition can not be changed in one day, or one year, or perhaps even many years but, of course, can be greatly improved.

Farmers will learn from experience how best to conduct their method of farming and ascertain which branch is the most profitable, and, yet it is a question whether it is wise to advocate special farming in the sense that farmers in general should depend on one branch of husbandry for their entire profits.

I believe that we can well afford to give some time and study in ascertaining what departments of farming will best go with what we understand as dairy farming.

Dairying as an occupation is one which demands regular and constant attention. It is a 365 day year with the dairymen. The cows must be milked and fed at certain hours and no excuse can be given for delays in any of the operations.

Dairying may also be classed as an intensive form of agriculture, that is to say, a form of agriculture resorted to by people who are living on small farms and in sections thickly populated. It is not necessarily better adapted to such conditions, but such conditions have proven that dairying is quite essential. The cow

being one of the most economical of our domestic animals we have, she is best fitted to places where great economy must be practiced.

Of recent years it has been discovered that dairy farming can be extended to any section of the country where stock can find abundant food and where market facilities are not wanting. For example, western Kansas and Nebraska are rapidly coming to the front as cream producing sections. This has been made possible through the introduction of the hand separator and the accommodations by rapid railroad traffic where cars are equipped with refrigerator accommodations.

Only a few years ago I was told by a prominent western stock raiser that the dairy industry had no place west of the one hundredth meridian. He informed me that this section belonged to the cattle men and that what milking was done should be done on horse back. He stated the condition which existed at that time, but was badly mistaken in his prophesy in limiting the industry. In fact, western Kansas, Nebraska, and South Dakota, and anywhere in the semi arid region butter fat can be produced as cheap or cheaper than anywhere else, and, it is more a question of reaching markets than a question of country.

It is safe to say that the dairy industry can be carried on successfully in any part of the United States where stock food can be grown, and whether we make a specialty of our dairy farming or not, is largely a question of whether we so choose to do so.

I believe, however, that certain branches of farming go much better with dairying than others. Where cream or butter is produced and where skimmed milk is retained by the farmer the valuable by-produce can be turned to a most profitable use in calf and swine rearing.

Poultry may also be included and will be found to go very nicely with dairying. Swine and poultry require little rough feed, such as cattle will require, but they do demand more concentrates and close every day attention.

Certain lines of fruit growing and seed production can also

be carried on nicely with dairying, but I believe generally speaking that grain growing or crop production for the market is not well adapted to the dairymen.

The growing of crops for the market requires a great deal of labor and a great deal of time at certain seasons. It is work which has to be done at certain times or a great loss is sustained.

The production of beef is also detrimental in that it requires the same food products that are necessary for milk production. Of course, the two lines can be carried on, but will conflict in a short time and by using the same forages.

Horse rearing is an industry that is rather difficult to carry on with dairying. Where colts are turned in with cows they are sure to cause damage in chasing or kicking the animals. The horses must have attention morning and evening at the same time the cows should.

It is very often the case that a farmer conducting several lines of farming will slight one or the other by giving a preference to his pet line. This often results in unprofitable dairy farming and is perhaps at the bottom of the greatest trouble today in profitable farm dairying.

The dairy cow can not be slighted. If she is, she at once becomes unprofitable or causes a scant profit. The man who gives his best feed to fattening steers or feeding horses, and at the same time is endeavoring to get the highest profit from his herd is finding that dairying does not pay. I really believe that such men would find it more profitable to devote all their attention to the line of agriculture they prefer.

I know of a large herd that produced last year on an average of 175 pounds of butter fat per cow. This herd is now being sold out by the owner on account of scant profit. I am satisfied had the herd been managed as it should have been a 250 pound average could easily have been produced. In this day of close competition it is necessary to practice economy in all lines of farming.

The branches best suited to dairy farming are those which can be conducted without interfering with the regular duties of

feeding and milking the cows. Such branches are extremely numerous and varied and can be easily introduced by the dairy-men at such times as he may see fit.

Poultry growing requires close attention and not necessarily at such times as the cattle may require. Honey production, fruit growing, special seed growing and such industries are particularly well adapted to dairy farming.

The average farm is perhaps 160 acres and the average farmer is not inclined to buy much feed for his stock, it is therefore important that he raise such feeds as are needed by the dairy herd. He should by all means raise the roughage and nitrogenous foods. Concentrates may be purchased if need be and are much easier to transport.

By raising nitrogenous crops he will receive two rewards, first, by furnishing a valuable food for his stock, and second, by enriching his land. Clover, alfalfa, cowpeas or soy beans are good crops to grow and a few acres of corn, sorghum or millet will furnish the carbohydrates to balance the ration. It is not important that much grain be grown, but I believe it is wise to grow enough to at least furnish all the straw that is needed for bedding. These, I believe, are the requirements in the way of crops for feed and what other farming is carried on should not to any great extent interfere with this production.

Dairy farming means soil enriching, and such crops as require a large amount of fertilizer can be profitably raised. In Southern Wisconsin where dairy farming is highly developed tobacco growing is a leading industry. The tobacco crop requires a very rich soil and does not interfere with the dairy work.

In New England fruit and vegetable growing are allied with dairying while about the same condition is found on the Pacific coast. The hen, the sow, and the cow in the Mississippi Valley are three good companions and seem to get along well together.

A small bunch of sheep will clean up many weedy places about the farm and will not interfere with the milking. While

cattle should not pasture with sheep, the latter will feed on pastures where cattle will not.

I find many farmers, especially in the west, who keep a few cows in order to obtain cash for groceries and household necessities while they depend on their crops for profit. Where such conditions exist the cows are apt to be neglected and a small profit is the result. Again there are some farmers who look on their dairy herd as a sort of insurance, if crops fail they know they have something to rely on. Frosts may come or hot winds blow, it makes no difference with the old cow, she is always there with a sure crop.

It is this reliable feature of the dairy industry which is prompting many to keep in the business. This is especially the case in sections where crop failures are common. Perhaps no other factor has been so strong in promoting and maintaining the dairy interest among the farmers.

The Danish people found some years ago that butter and pork production went well together and since then they have found little difficulty in making money on ten acre farms.

Special dairy farming is profitable and well to advocate, but we must remember that the average farmer is not a special dairyman and if he wishes to become one it is safer and wiser to grow into rather than go into the business.

DISCUSSION.

Q:—What price do you get for cream?

A:—That is a good question. We don't sell cream, we sell butterfat. We sell the cream, but are paid for the butterfat. We get about as much for our butterfat as butter brings in New York. Perhaps that would be a good answer, for you know something about it if you know what New York butter is; about the price of creamery butter—24 cents today.

Mr. Newman:—You say you sell butterfat?

A:—Yet sometimes as high as 30 cents. Some goes west and they want it there. We just about count we can get as much for our butter fat as butter is bringing in the eastern markets.

Q:—Where do your dairymen get your cows?

A:—We got them right there, got lots of them in Nebraska. They are not good cows, but are improving. We find we can get native cows and can get good results with good care and feeding. Still there is quite a little improving along the line of stock.

Mr. Newman:—How cheerful to live in a country where they are getting good prices, but thirty cents for butter fat in Nebraska is better.

By the President.—

We have with us this afternoon a representative from the World's Fair at St. Louis. We had hoped to have Mr. Taylor with us, but he has sent us Mr. Sudendorf instead.

ADDRESS.

By Mr. Sudendorf, St. Louis Exposition.

Ladies and Gentlemen and Brother Farmers:

Mr. Taylor expected to be here, but at the last moment found it would be impossible. He has too much work to do in his office and can't get away. I am sorry for your sakes that he can't come. I can't give you anything that will keep you very long. All I can do is to express his regrets at not being able to come and extend his welcome as Chief of the Agricultural Department of the exposition.

I want to tell you that we have the largest building ever erected for agricultural purposes. We have a building that is 1,660 feet lengthwise and 525 feet wide. It is large enough to put 400 stores there, 57 railroad trains and you can walk all around. And in this building the Exposition has given the

dairymen almost 40,000 feet of space in which to exhibit not alone machinery and utensils, but butter and cheese.

There will be erected a model dairy, which will be in operation during the session, 200 feet long and those who are interested than just to see, can come inside and get all the good out of it they can. This building will contain in the first place a testing room for making all kinds of tests. It will contain a fully equipped cheese factory and model farm dairy, a dairy that any man can come there and learn something from, and if you will all come there and take a good look around and go home and equip a dairy like that you will all make more money from your cows. We will also have all kinds of separators running and you can see for yourselves which is the best. We will do churning and skimming and pastuerizing, and will also have a sanitary milk plant. This will be in operation every day. There will be shipped in from five to ten thousand pounds of milk every day, besides what we get from the herds. That is all as far as the Exposition is concerned. We hope you will all be there so I can fill you up with buttermilk. If you haven't got a button you won't get any buttermilk.

I want to say a word as a citizen of Illinois and interested in the dairy industry. I make my living out of it one way or the other. This state in 1899 was the third state in the union in size and value of dairy products. You produced 31 million dollars worth of dairy products. Only two other states ahead of you, New York and Pennsylvania. The great state of Iowa was behind you and only produced about 29 million dollars worth.

Illinois produced, I think, something like three or four million dollars worth of horticulture, fruits and flowers and nuts and everything that comes in that line. I am treading on some people's corns and I may get shaken up, but I don't care. But I do know that they have got \$14,000 set aside for horticulture, and they have been trying to get \$15,000 for dairying and can't get it.

New York is going to have a beautiful display in a prominent place and they are going to have this fine display and don't get

near as much milk as you do here, but they have got to show the people what they can do. You must get after the commission. You will be told, "Why I thought you made the finest butter in the country, what's the matter?" And the answer will be, "Well, but we haven't got any money." Had \$150,000 appropriated and nothing to make a dairy exhibit. I don't want to stand that kind of talk and you people of my own state I want to prod you on. You want to get after these people to get what's coming to you. That's all I have got to say, and I thank you Mr. President.

By the President:—It might be proper to state right here that I tried to see to this matter six months ago and we formed a committee composed of two of this Association, the President and Secretary, two from Chicago Butter Board, a body of merchants who handle dairy products, two from Elgin Board of Trade and Mr. Glover from the University. We formed that committee and that got in communication with the World's Fair Commission through Mr. Dunlap. The dairy committee of the commission was first formed with Senator Alschuler from Kane County as chairman, but for some reason unknown to me Mr. Alschuler resigned from his position, and there was appointed in his place Senator Mounts, a gentleman who knows nothing of dairying. We went before them at Springfield and met them and asked them to let us run the dairy exhibit, but under their control. We went to ask the Senator to make a report. We wanted to go as window dressers to Mr. Mounts and under his control. We told him and met him again and presented our case again. They talked very nice, but up to this time they have not done anything. I told them three months ago they must secure one of those corner cases for Illinois. If we couldn't get that we didn't want anything. I suppose there are higher powers even than the committee. We want to do things pleasantly, but we are going to try to do it just the same. I still have hopes that we will have an exhibit, but it is too late for the corners as I see by a letter received. New York has got a corner, Wisconsin a corner, Minnesota a corner and Iowa a corner.

If we go in now, we will have to go in some central part of the case. That has not come to us in writing, so even in that feature we are not sure. There are only two 16 feet places left in the middle. Any pull you have with these gentlemen use it for you are liable not to have a dairy exhibit at all, and that from this state that is producing thirty million dollars worth and probably this year thirty-five million dollars worth of dairy products, and yet horticulture will get more money and only had four million dollars worth of products. I don't blame Mr. Dunlap, but I do want our share.

We think we have a very strong committee, as strong as the state can give them. We can't get the desired amount because there is a screw loose somewhere. They have a great many claims for the money; all manufacturing interests are after it. They started first with an offer of \$2,000 for dairying, but it costs \$2,000 to get this case. We don't want a case and nothing in it or nothing to do any work with. To put butter therein the way it ought to be done and a man to look after it takes money. You can't work in St. Louis the same as you can in Greenville. I am satisfied we could have made the display if we had been given the reins. These sculptors of butter are all busy, and there are only a few of them in the country. When this was first mentioned and we had engaged them then, we could only have come in fourth if employed at that time. If we get them now they may not be able to get anything done before July. This same committee will ask to be continued, and the Committee on Nominations will have a chance to vote on it.

By the President:—We will now have the report from the Nomination Committee, by Mr. Kimsey.

Mr. Kimsey:—To the Hon. President, Officers and Members of the Illinois Dairymen's Association.

Gentlemen:—We, your committee, appointed to make nomi-

inations, do recommend the following persons to serve as officers of the Association for the ensuing year :

President, Joseph Newman, Elgin.

Vice-President, L. A. Spies, St. Jacobs, Illinois.

Board of Directors: Joseph Newman, Elgin; J. R. Bidulph, Providence; L. A. Spies, St. Jacobs; Irvin Nowlan, Toulon; G. H. Gurler, DeKalb; L. N. Wiggins, Springfield; M. Long, Greenville.

Also, to serve as an Advisory Committee to act with the State Experiment Station, said Committee to serve through the life of the present state bill in the place of the committee appointed temporarily by the President last spring, we would recommend H. B. Gurler, DeKalb; Joseph Newman, Elgin; Irvin Nowlan, Toulon; A. N. Abbott, Morrison; M. Long. Greenwood.

Respectfully submitted,

E. Sudendorf, Walter R. Kimsey, A. J. Shearer, Lewis N. Wiggins, J. A. Latzer, Committee.

Mr. Kimsey:—I move the report of the committee be approved.

Seconded. The report is adopted.

I move the persons whose names are mentioned in the report be elected and so declared officers of the Association for the ensuing year.

Seconded.

By Mr. Newman:—I see that you have left my name on that list again as President of the Association.

I have served three years. I have not done a great deal, but I have tried to be faithful, and I hoped at this session you would see fit to elect some other man. I would like to see this Association carried along broader and wider and deeper lines, and I want you to consider this before the question is brought to a vote. I think it wiser to have these changes every two or three years.

A Member:—I should suggest that we keep Mr. Newman in the chair.

Mr. Kimsey:—Is it by ballot? Yes sir.

I ask the Secretary to cast the ballot.

The ballot is cast and you have elected your officers for the ensuing year—the names of the people who have been read.

Mr. Newman:—I suppose I should make a congratulatory speech, but I don't feel like it. Of course I shall try to do my duty, but I can't give any more time to it than I have in the past, and probably not so much. While in the chair I shall do what I think right, and I may get in hot water, but I shall not bring any disgrace on your Association.

We have certain things to look forward to, but we must point out the weak places every time we see them. We have no personal feeling in this matter whatsoever. We want the best men in the University and have said so, and I think you are with me. We are working together to bring all this work to a higher grade. When we lost our friend, Erf, I felt that it was a serious loss and made no bones in making it known. If you want a man in the chair who won't do these things, you will have to elect some one else to this chair besides Joseph Newman.

CREAMERY BUTTERMAKING.

By J. W. Hart, University of Illinois.

Mr. President, Ladies and Gentlemen of the Illinois Dairy Association.

I am very much pleased to be with you and see this grand convention. It reminds me of the meetings in Canada, where I have been for the last five years attending associations. The problems are very much like the problems we have across the border. Dairymen have the same questions to meet and settle in very much the same way. There are some differences in regard to local conditions which we have to take into account.

In some sections I think the silo is all right. The silo is

not the thing in your section. You are getting high prices for your milk, and it will be well to take the advice of those who have the knowledge. Even if it costs a little more to make, when you think of the market, you are getting much more for your milk and you can afford to do without the silo.

The question that comes up in our conventions, especially in the localities where there are Scotchmen, is the turnip question. The Scotch and the turnip are connected in some kind of way. Where you get Scotch blood, you get the turnip. They will feed them to the dairy cow to the injury of the cheese and butter. The Scotchman thinks it is all right and insists the turnip does not flavor the cheese and butter. The way that has been settled in Canada in some factories is this, the man that persists in bringing that milk, binds himself to pay for the losses in handling his cheese. The cheese up there is guaranteed by the maker. If he makes a batch of bad cheese, he has to stand the loss. If a batch of milk is turnipy and they take that milk the man has to stand the loss if it injures the cheese. If you could make some such kind of an arrangement here, I think it might be satisfactory on both sides.

In speaking on creamery buttermaking, the subject I was to talk about, it is too big a subject for me to accomplish in a short time. It would take a whole day to say all I ought to say on that subject. We cannot consider all the ground, and will only touch on some of the points that perhaps would need discussion, and possibly you can think of other points that ought to be brought up. I will answer any questions I can, and if I cannot answer the questions, I will refer you to some one else.

In speaking upon this subject I am aware that it is too big a question to discuss exhaustively in the time allotted, even if the audience had the patience to listen.

In districts where dairying is extensively carried on some form of combination among dairymen is certain to take place, and the desirability of such community of interests is too obvious to need any arguments to support it. In my opinion the great weakness of all kinds of cooperative dairy work is the selfishness

of the average man. True cooperation requires that he sink his own individual preferences in his concern for the general good. Selfishness too, is at the bottom of the building of so many small and poorly equipped creameries handling only a small amount of milk and that at much greater expense and waste than in large creameries. Most of us can call to mind instances where prosperous creameries have been wrecked by a few disgruntled patrons, who were not willing to be governed by the majority. Patrons should reflect before they allow themselves to become interested in any project to start a new creamery in territory already occupied. They will usually find that it will be best for themselves and also for the community to rally to the support of the existing creamery rather than have two or three small inferior plants in operation. If the proprietor of a creamery cannot get along satisfactorily with his patrons, it will be better for all concerned to have him sell out rather than to build an opposition creamery for the purpose of forcing him out of business.

When we get genuine cooperation among all engaged in the dairy business including the patrons and manufacturers, those that build and equip creameries, and the men that transport and deal in butter, there will be greater satisfaction and prosperity for all. In most progressive dairy districts great advances are being made, but much remains to be done.

There is absolutely no excuse, if any, place used for the handling of butter or other food for human beings is not kept scrupulously clean and neat. Filthy creameries, if such exist in this state, should clean up or shut up. The best test of cleanliness is the condition of the air in and about the building. This should be as pure and sweet as in a model dwelling. It should not be possible for the most sensitive nose to detect any unpleasant smell anywhere. A creamery man who is personally clean as he greets his patrons from a spotless weigh-stand has a good moral influence over them. Suggestions made in regard to caring for the milk are received more graciously from him than from an untidy and slovenly buttermaker.

The only satisfactory creamery floor is cement concrete,

and all foundation and partition walls should be carried up a foot or more of the same material. Hollow brick walls are better than solid walls. Cement mortar on metallic lathing makes a satisfactory material for walls both outside and in. Wood is the least satisfactory of all materials used for inside creamery walls. Walls should be kept painted, kalsomined or whitewashed. A very cheap and durable whitewash is made of portland cement and quick lime in equal proportions. These should be slaked separately with water and thinned with skim milk, to the desired consistency. Ventilation should be provided for and all waste should be carried away to safe distance in a tight covered drain, properly trapped and vented. An abundant supply of pure water is indispensable.

Our buttermaking industry has not kept pace with our manufacturing in other lines. American manufacturers are the most enterprising in the world and their wares are found in the uttermost parts of the earth. The adoption of better business methods in dairying will result in greater profits.

Milk, the raw material from which butter is made, should be of the best quality in order that the butter may be fine. The buttermaker who accepts bad milk or cream injures the whole body of patrons including the owner of the milk. He harms his employer and is guilty of fraud on the purchaser and consumer of the butter. Most of all, he injures himself. A buttermaker who will knowingly accept milk rejected at another creamery is a disgrace to the profession and the time will come sooner or later when he will suffer for his sins.

To make fine butter and the greatest possible yield from the milk at the least possible cost for labor (always the expensive item in manufacturing) the machinery should be the best procurable and should be so arranged as to economize labor. Most creameries could be improved in this respect.

A buttermaker holds a responsible position. If he is honest, clean, skillful, painstaking and obliging, he should command good wages. A man who is wanting in any one of the above qualities is dear at any wage. The tendency to cut down wages

and to employ cheap men is not the mark of business sagacity. The prosperity of the creamery often depends more upon the buttermaker than upon any other one man. The difference between what might be termed a fairly good man and a first class man will amount to many times the difference in their wages.

To make butter of the finest quality, pasteurization is necessary. In Danish creameries pasteurization is all but universal and Danish butter not only brings the highest price on the British market, but is shipped over the world. All buttermakers are familiar with the fact that the prize in the contest conducted by the National Buttermakers' Association during the season of 1903 was awarded to pasteurized butter with an average score of 96.75 per cent with 429 contestants entering butter. The best time to pasteurize is before separating, thereby arresting the injurious fermentations at the earliest possible stage and increasing the efficiency of the separator by skimming the milk hot. If preferred the cream may be pasteurized after separation. In cream gathering creameries efforts should be made to have the cream delivered sweet; if not, it should be pasteurized after it has been sufficiently ripened.

The separator should be adjusted to take rich cream, say 35 per cent fat, if the milk is raw, or 40 per cent if pasteurized. After separation the cream should be cooled to the temperature at which it is desired to ripen it. The proper culture should be added at once. It is all important that the culture have a clean aromatic flavor, otherwise it is better not to pasteurize. From 10 to 15 pounds of culture should be used to each 100 pounds of cream. Ripening pasteurized cream does not help in any way to make the churning easier or more exhaustive. The viscosity of the cream has already been destroyed by the pasteurization. In fact pasteurized cream churns more easily sweet than ripened. Ripening pasteurized cream is for the purpose of giving the butter the desired ripened cream flavor. Cultures should be propagated daily. Kept longer they lose their vitality and soon run out.

Every buttermaker should use an acidimeter for determining the acidity of his cream. The most satisfactory apparatus

consists of a 25 c. c. burette graduated in tenths. A ten c. c. pipette is used for measuring the cream. The alkaline solution is made one tenth stronger than decinormal and phenolphthaleine is the indicator used. With this apparatus the percentage of acidity may be read directly from the burette.

The churn should always be scalded and cooled before being used. If this is neglected once the churn is damaged beyond repair. The temperature used in churning should be such that the butter comes in about three quarters of an hour. The churn should be stopped while the granules are still quite small. A few small particles of butter may be lost in the buttermilk, but with fine butter granules it is possible to hold 2 per cent more moisture in the butter in a very finely divided condition, giving the butter a much drier appearance. In washing butter a quantity of water equal to the buttermilk removed should be used. The temperature of the wash water should be such as will leave the butter neither too hard nor too soft for working. Butter should be salted in the churn whether the combined churn is in use or not. An easily soluble salt, not too fine grained should be used. It should be so applied as to be thoroughly mixed through the butter with the minimum amount of working. From $\frac{3}{4}$ to $1\frac{1}{2}$ ounces will be required according to the condition and amount of moisture in the butter and the demands of the market. After being salted and worked lightly the butter should stand until the salt has dissolved when it should be reworked and packed or printed..

Packages should be prepared by steaming and soaking in brine containing 1 per cent of formaline. Liners should be of the best quality of parchment and should be soaked in the same solution. The finish should be neat and the packages clean.

Butter does not improve with age. If it does not go into consumption at once, it should be held at the lowest possible temperature preferably below zero.

The intelligent buttermaker will take a friendly interest in his patrons' affairs. He will not only be an expert in his own particular line of work, but will post himself on all phases of the

dairy business, particularly along lines that will be of benefit to the producer of the milk. The buttermaker should not lose sight of the fact that the man behind the cow is the main factor in the business. Through any assistance he can render him to improve quality and cheaper production he thereby helps himself.

To sum it up I would say, that people must reflect upon the cost of manufacturing, and if we can get the number of creameries cut down and the quality of the output and the quality of the milk improved, it will help the interests of all concerned.

Those dealers in Chicago get orders for thousands of pounds of butter of certain brands. If they can pick it out from large creameries, they can afford to pay bigger prices for goods of that quality. Strictly high grade goods and goods of good quality and made in large quantities are more satisfactory.

While speaking of dairy manufacture, I am only speaking of one part of the manufacturing process. It is the dairymen's business to take the bulky product and produce milk from it, and the cow is the machine that he uses.

We follow the business a little farther and hear how it is manufactured into cream, butter, cheese or condensed milk.

Another thing, don't dispose of milk off the farm that you could use as human food. It is the cheapest food and people appreciate that and want to get it as cheese and butter and pay for transforming it into butter and cheese, and pay the dealers for handling it, but you should use it as much as you can. Farmers are divided into two classes; one that eat all they can't sell, and those that sell all they can't eat. Milk is the first thing you should try and keep and use all you can. Keep plenty of milk at home, it is the cheapest food and use lots of it before you send any away.

The best test of cleanliness is the air in the building. The time for building wooden creameries is past. Wood is an expensive material. It does not last more than five years and has to be repaired, which is usually unsatisfactory. The pores of the wood become filled with milk that spoils and the odor is very noticeable and germs breed in these places and it cannot be kept clean.

The house will leak and the milk will leak through and the stench is terrible. The only satisfactory material, and I have seen it used for years, and that is cement for the floors. Butter-makers say that it wears out their boots too fast; that is the only thing against it. As I said, hollow brick walls are better than solid walls, you can keep a better temperature. They are cold in summer and warm in winter. Make a double wall by putting up the studding as if for lath and plaster. Follow that with any kind of covering, shingling and putting cement and mortar right on, especially on the inside. For winter, and for rooms you want to control the temperature, put on several thicknesses like that, putting on paper and deaden all spaces to regulate the temperature, so the heat will not pass through the walls, or, as some people put it, the cold will not pass out.

Keep it whitewashed, it makes it sanitary. This applies as much to where the milk is produced, as where it is manufactured. We have got into a slipshod way of making butter, and our work is not as good as it might be. We must improve our conditions.

American wares are found all over the world, and if we can improve the quality of the butter as much as we have other manufactures, and cheapen the manufacturing process, we can take a high stand after we have supplied the home market. In place of shipping grains abroad, we can use these grains and shipped stuff a good deal more profitably at home, and export the butter instead because as you have been told, there is no better way of keeping up the fertility of the soil than by dairying.

You know butter is judged by the appearance, and it is not always eaten right away, but kept and oftentimes it becomes rancid. If it was made under cleanly conditions it would be as good at the end of a week, or should be. The keeping point has not been given that consideration that it demands. That is what makes the value of the brand of butter. When manufactured in the way it should be, it keeps and should be sweet and good, and you will find that the brand is called for and has a market value; if made in a slatternly way it is not wanted and the prices go down and the brand is always avoided. The people want something they can depend upon, and that has the keeping quality.

DISCUSSION.

Q:—How do you find so many c. c.?

A:—Practically so many gramms.

Q:—It would be a good thing if we would get together?

A:—This is the French system and used by Lloyd. We know exactly what we are talking about when we say per cent of acidity and it is very easily made up by a chemist.

Q:—We use tablets?

A:—They vary, are not uniform in strength. Always keep alkaline test.

Q:—Did you give it 10 per cent?

A:—No, the same strength 1.1 normal solution equal quantities will counteract each other. The proper stage to commence cooling is right after separation and he can control conditions much better. I like to ripen the cream early and get the proper acidity early and you can do your work by daylight. The trouble with a good many buttermakers they do not work quickly.

Mr. Gurler:—If the per cent of fat in cream makes a difference in pasteurization. Suppose you had cream 20 or 40 per cent, would you get the same results from that cream of 20 or 40 if pasteurized, or improve the quality of the butter?

A:—There is this about it. There is considerable waste, the more used the greater the waste. I would rather pasteurize the milk in the first instance. Pasteurize the thick cream and it can be diluted even with clean water before churning.

Q:—That isn't what I want to know. Will you get a less loss in the thick cream, in the butter milk than in the thin cream?

A:—In churning. The richer the cream the less the loss unless it should stick in the churn. If it sticks and no motion takes place, then you have to thin it. I would like to get the cream thin enough so it would not stick. I have churned pasteurized cream 35 per cent fat to 1.1 fat. You can hardly tell the butter fat from the sweet milk.

Q:—You would not improve the quality of the thin cream as you would of the rich in pasteurization?

A:—I would not say that. I think it would improve the quality in any case, only probably not make such difference.

Q:—If the cream was in condition that would run through the pasteurizer?

A:—It would improve it.

Q:—How many points?

A:—That would depend on how good the cream was. If good and clean the pasteurizing would not improve it any.

Q:—We had experience in that line, and we were not able to get any improvement in pasteurizing that 18 or 20 per cent cream any way we could fix it and got a good loss in the buttermilk and a double neck bottle would not hold the fat.

A:—More than 1 per cent in the buttermilk.

Q:—Yes, could not get any quality and it did not improve the quality one point.

A:—Is that so. You have a big amount of buttermilk and a large test of fat in that buttermilk both ways. It is economy to reduce the cream to the lowest possible per cent and you get less loss in handling it. Less loss in separating than in churning.

Q:—What per cent of acid in the cream?

A:—It was cream that went right into the creamery. I would run cream through the separator first and condense the cream.

Q:—Run it through just as it was?

A:—Depend on kind of separator I was using.

Q:—You spoke of churning three fourths to an hour. It depended on the amount of cream?

A:—Yes sir, with a very full churn. We have tried to raise the temperautre to have it come in that time. It would not hurt to churn one and one-half hours. Not more than 2-5 full is best. Sometimes they get it too full.

Mr. Lee:—Talking of pasteurizing of thin and thick cream and cream with a high per cent of fat. I have had experience with that. In trying to pasteurize hand separated cream. It came into the factory and we had better success where we had the cream containing a high per cent of fat than a low per cent

of fat. In pasteurizing such cream the loss is quite heavy at times because of the casein curdling slightly. It did with the pastuerized we used. Run the buttermilk through a strainer fine enough to take off the curd, bring the buttermilk down to a small per cent of fat, but your loss is in the precipitation of the curd. In pastuerizing cream in factories, get a high per cent of fat, about 40 per cent and not effective as thin cream. Reduce it to what you want for churning is best. 40 per cent will stick to the churn and have to watch it closely. We had very good results by diluting the cream just at the point of breaking, but as a rule that is not a practical way of doing.

Mr. Cobb:—What kind is that separated cream?

A:—15 up to 50.

Q:—In pastuerizing 20 per cent cream what is the loss?

A:—I could not say. I have not practiced the handling of thin cream at all and have no estimate. It is considerable though.

Mr. Newman:—In the precipitation of the casein, would the fats adhere to the casein and there would be loss in that?

A:—In the thin cream getting it in that stage you would have considerable curd and that curd would thicken in pastuerization and hard to get through the churn.

Mr. Lee:—We found the curd was not large enough to show up in the butter.

By the President:—We will now have the pleasure of listening to Prof. Van Norman of Perdue University.

ADDRESS.

By Prof. Van Norman, Perdue University, Indiana.

Ladies and Gentlemen of the Convention.

If a college man were to go into his office and his class room, and begin to tell what he knows, and keeps on telling what he

knows, it would not be very long before the folks outside would know a lot of things he did not hear of. We have got to get outside and know what other men are doing, and because of that opportunity, I appreciate this privilege of coming here today and meeting and hearing leading men in your state. When asked to speak at this convention, it was suggested that the conditions here in this state are the same as Indiana.

In order that I may have a little pointer to go on with, I would like to ask a question.

Q:—How many are milking over 10 cows?

A:—18 or 20.

Q:—How many are milking less than that number and selling a little butter or milk to the store, or retailing any of it?

A:—That takes in most of the rest of them.

That is just the condition in our state. I have to cultivate the way of saying "you dairymen." We are not dairymen, we are farmers. I have been in creameries where the milk sheet showed 80 to 250 names, and not found five sums that required three figures to write, 40, 50, 90 pounds milk. The creameries are largely supported by farmers who are selling a little milk to the creamery. That, I presume, is not very different from the conditions here.

If I wanted a text for my remarks this afternoon, it would be "Not more cows, necessarily, but better cows." I would like to incorporate into my speech that next to the last page of Prof. Haecker's remarks as to the advantage that it is to profit by the products of the cow on the ordinary farm, of how well she fits into the farm, and how the farmer depends on his cow as he does in the hard times. It is true at times, lots of our Indiana farmers let the calves run with the cows and depend on the beef. They do it because they can make a living with beef, when beef is high. It is not a question of how to make the most money, but how to make it easiest. Any one can shovel corn to a beef animal, but can't make butter or handle a dairy cow.

Now then, I claim this: If every farm in our own state and it is true of yours too, could be relieved of one unprofitable

cow, it would mean an immense amount of money to the farmers of our states. Therefore my claim is, not what your cows are doing, but get rid of the ones that are not paying. What's the use of having one cow that is eating anywhere from \$20 to \$30 worth of feed in a year, and only giving you back \$15 to \$28 or \$29 worth of dairy products, when it is just as easy, if you will only start and get after it, to have a cow that will eat \$35 worth of feed and make \$40 or \$50 worth of butter or milk. It does not take long to milk her. You got to do it only so often and what's the use of working a scrub cow.

I have collected from different sources some figures which I am not going to read to you. We learn better through our eyes than our ears. They represent bare facts, and if I was going to give a second text it would be, "Know the facts and don't jump at conclusions." But I want to give you just a few facts.

Individual record.—One of our experiment stations reported these figures which are so nearly in accord with my facts, that I have simply taken some of them and put them up here as a sign to go by.

Two farmers owning 42 cows and delivering milk to a creamery. The station sent a man to get these figures. Data was kept throughout the year, and only take a few individual records which illustrate general conditions. And here is a little remark I want to make right here. There is an immense amount of truth coming from experiment stations and agricultural papers, that a very large amount of that truth produces harm because the reader or the hearer does not use the necessary 40 or 50 per cent of common sense in his application of that truth. When I give you these figures, don't get mad and forget all the rest of it. Take the principle, the lesson which they teach, and adopt it to yourself.

One of these 42 cows milked 352 days, made 7,900 pounds of milk, 350 pounds fat, and creamery paid \$70. That allowed \$32 for cost of keeping. In our state, I figure \$30 as an average, I have inquired of farmers. \$30 margin on that cow.

No. 38 milked 365 days of the year, 3,800 pounds milk, 184 pounds of fat. The difference between the cost of feed and return was \$4. Now then that cow is a registered Jersey. This cow is a registered Jersey. What's the lesson? Registration don't amount to anything. The cow does the work, not the registration. You may have a scrub Jersey and you may have a good Jersey. Don't let registration take precedence, that is not what produces milk. It is the style and character of the cow, her ability to eat the food and convert it into milk. It is better than breeding or color. When it comes to producing another cow from her, then the question as to breeding is of vital importance.

Here is a grade cow, two of them. No. 20 had \$15 profit, No. 37 had \$6, and yet No. 37 made nearly 1,000 pounds more milk than the other one.

This man is selling butter fat to the creamery. To you then the question of milk is all you are interested in.

Here we have a couple of cows that did not pay for the feed they ate; wouldn't supply the man even with cigars. He was \$3.77 in the hole.

The point I claim is here: If these two men had killed those two cows and dragged them in the woods and let them rot they would have been better to him in the end of the year, than to have kept these two cows. They would have their feed to give to other cows and saved the labor of caring for them. All they would have been out would have been the manure. At the end of the year they would have been better off without them. But it is not necessary to get rid of your cows in that manner, you can always get a little for them.

I think we should know more accurately just what our cows are doing. It will pay to do it. It doesn't take very much time, and only a little bit of backbone or nerve to get up or something like that.

In the same community where these observations were going on were 58 farmers delivering milk to a creamery. Twenty-one cows averaged \$54, 32 cows averaged \$22. Look down the line, out of 58 farmers there were about 14 or 15 averaged less returns

per cow than the average expense of keeping a cow in that community. The report don't tell what line of farming they were in to produce the wherewithal to feed those cows, but I question if the calves made enough more money to make up the loss in the butter fat.

I brought these figures before you to suggest to you, "are all my cows paying for themselves, what ought a good cow to do." My father visited me last week, and I don't take a back seat for any one's opinion compared with his.

They have milked 959 different cows for a whole year. The milking of every cow is weighed at every milking. When I tell you the number of pounds of milk they have produced, it is the scales. After the milk is weighed at the barn, it goes into the dairy room and is bottled, and the milk is sold and the bottled milk must accord with the figures at the different barns. There is no room for humbug.

Average 959 cows, 5,862 pounds of milk, test a little over 5 per cent. Figuring that out gives us 300 pounds butter fat. Those are grade cows bought in the stock yards near one of our eastern cities. Most of them have a little Jersey blood.

The point I want to make, the cows are selected according to dairy type. They are fed according to business principles. They are milked in order to know what they are doing. They get rid of the cow that doesn't pay. There are in that lot a good many that have made 1,185 pounds in the year, another one made 1,400 another 1,900 pounds, and some running on up as high as 9,500 pounds a piece.

I speak of this to show what can be done with good business head and judgment in studying your cows. I am not advocating that you weigh the milk every day, but I do advocate that you know what your cow is doing. I believe there is no man who is keeping two cows or more that can't afford to weigh the milk of every cow one night and one morning each month in the year.

Experimental Station figures have shown us that the result of weighing the milk one night and morning every month in the year multiplying that by the number of days in the month and

take the yield for that month and adding at the end of the year something like 5 per cent of the actual amount given. That is a good deal closer knowledge than we are getting. There is not a man that has a very firm opinion in his own mind as to which is the best cow and whether she is profitable or not; but when they take the scales and get the figures, there is plenty of evidence that they have been badly fooled, and the cow they thought the best was the most expensive cow in the barn. There is the importance of knowing.

My whole plea is to know what you are doing. If you are selling milk to a creamery and are paid by butter fat, it is a simple matter to take a composite sample of this milk, and they will test those samples for you if you have no Babcock test.

Then I have another chart which I had not intended to inflict on you, but it figures in here. Basing it on the fact that every product of the farm contains more or less of the same fertilizing element as you buy at the store in the form of commercial fertilizer, \$100 worth of roughage from the farm sold at average prices takes off the farm from \$65 to \$95 worth of material. In other words, you sell \$100 worth of oats, straw or corn stover and got to buy fertilizer, you have to pay somewhere from \$65 to \$90 for it. \$100 worth of crops, \$35 to \$60. \$100 live stock \$6 to \$11. \$100 milk about \$10, \$100 of butter 11 cents.. Why is butter so much lower than milk? Because the fertilizer is there. The casein portion of the milk contains the nitrogen and the nitrogen is the expensive element.

Putting it on another basis. Here are some figures taken from 32 different farms, just a few picked out. For every dollar worth of feed consumed, 31 received \$2.03 worth of dairy products from his cow. This man only 99 cents worth for every \$1. That means that if you can produce your feeding for \$1 and sell it in the market for \$1 and make a margin, sell it to the cow at the same price and she will work it up and only returns you 99 cents, and others as high as \$2 worth of dairy products for that \$1 worth of product.

To come a little closer to my facts, here are three cows from the University. Where we are situated we buy in small lots. We are paying \$22, \$23 and \$24 for bran. We have to buy small lots and it makes feed expensive. There is not a farmer in the state but who can feed his cow cheaper with three-quarters of the effort than we do, because he only need charge her what he can sell it for, instead of charging jobbers prices.

Primrose was a little older, has fairly narrow shoulders, great big bread basket and a pretty good udder. She is a dairy looking type of cow and she gave us \$1.82 for every \$1, and another cow that was a little past her best days several years ago gave \$1.57 for every \$1 worth of feed.

There should be a fair margin in feeding and caring for the cows on the farm. There are not very many farms where there are not one or two cows that are not paying for their feed. A little study on the part of the owner will discover which one that cow is. If you have a boy 15 or 18 years old, there is nothing that will do more to interest him and help to keep him on the farm than to put him at this problem.

A young fellow came to the dairy school one winter. He wanted to get away from the farm as soon as he could. Because they were keeping some cows at home, he took the dairy work, and when I visited him a year later, I saw a sheet of paper on the side. "That's not for you to see" he informed me, but my curiosity was aroused. He was keeping a record of his cows. He was finding out what his cows were doing, and I thought several of the poorer cows would get out, and his herd would be a little better. He had received his start through a better knowledge of dairying.

There are lots of you who have children who can attend to weighing the milk one day in a month, one night and morning, multiply it by the number of days in the month, and next month do the same, and you will have better results in knowing what you art doing. Compare it with the returns at the factory, and if you have not made any mistakes, you will find they do not disagree very much, and you will have found out something that

you did not know before. The future farmer has got to do this. There is no business on earth where the margin of profit is so big as to the man who conducts a farm business and there is no business on earth where the man knows as little about it and what he is doing as in the dairy business. A banker or a mercantile house that didn't know more about their business than the dairyman knows of his would have to shut up right away. Even men running creameries don't have enough margin of profit that they can do business the way we farmers do.

Suggestions on Care and Feed.—Have some oats and peas, sweet corn, sorghum, early planted field corn, other forage crops, or left over silage, to supplement pastures in dry time.

Allow the cows in a darkened shed or barn in fly time.

Keep the cows out of the stalk field in winter. Cut the corn and feed fodder in the stable or yard.

Shelter from raw winds, even on bright days in the winter.

Feed a combination of feeds from the following lists, at least one from each rather than only one or two from either, and that corn, and corn stover or timothy hay.

I

corn
corn stover
corn silage
millet hay
oat straw
sorghum hay
timothy hay
wheat straw

II

alfalfa hay
bran
clover hay
cow pea hay
cotton seed meal
gluten meal
linseed meal
oats
soy beans

Since the feeds in the first column are rich in fat and heat producing material, and especially poor in protein, which is absolutely necessary for milk production, and the feeds in the second column are all much richer in protein, a larger yield of milk will be secured when a combination of feeds from the two groups is fed.

Breed the cows to calve in the early fall, and make the most milk and butter at the season when conditions are favorable for making and prices are high, and there is more time to care for the cows, the milk and butter.

Don't breed to a scrub sire. The best one available is none too good.

Raise the calves by hand and substitute vegetable fat in the form of ground flaxseed jelly, and later corn meal, etc., in connection with skim milk, for the butter fat in the whole milk.

Know what cow is not earning her feed and dispose of her.

Brush with a brush or wipe with a damp cloth the udder and flank before milking. Twenty to 90 times as much dirt falls in the milk from the unbrushed, unwashed udder as from the washed one.*

Milk with dry hands.

Don't allow the milk to stand in the barn.

Don't use a so-called dilution separator; set a can of milk into cold water, but don't mix water and milk. An eighth to a third of the butter fat is often lost by diluting the milk with water.**

Don't mix sweet and sour cream less than 12 hours before churning.

Own and use a dairy thermometer—cost 25 to 50 cents—it will save many times its cost, if it is used and the cream is churned at the right temperature. They may be had from any dairy supply house and very often from the local druggist. They should be all glass. The cheaper ones are not always accurate and should therefore be compared with a reliable one.

Salt by weight and measure—not by guess.

Wash the butter milk out.

Don't overwork the butter; it injures the texture.

Have a butter worker; it saves labor and helps quality.

*Illinois Bulletin No. 84.

**Cornell New York Bulletin No. 151.

Put butter in rectangular prints, (they are more attractive and pack better).

Use parchment paper, not wax paper.

Use dairy salt; not table or cheap barrel salt.

Encourage some young member of the family to take charge of the butter making, and make a business of it. A Hendricks county girl who learned to make good butter, makes a business of it, has increased her trade from the product of three cows to that of 15, and could sell more butter if she had it.

Be prompt and regular with delivery.

There is a reasonable profit in good cows well cared for.

There is a good market for more first-class butter, milk, cream and cheese than is produced.

Indiana is nearer the great markets than many of the leading dairy states.

Much land in the state is better adapted to dairying than to grain farming.

Much land needs the manure that can be produced by keeping more good milch cows upon it.

Care of milk for creamery, cheese factory or shipping. The Cow.—The first essential for good milk is to prevent the dirt getting into the milk. It takes but a moment to brush the udder and nearby parts just before milking. It is even better to wipe them off with a damp cloth, as the dust will then adhere to the damp hair rather than fall into the pail.

The milk should be removed from the stable as soon as possible, as it absorbs stable odors very quickly.

Strainers.—With the best of care there will be some foreign matter fall into the milk, which a strainer will remove. A fine wire strainer is better than none, but two or three thicknesses of cheese cloth, if properly cleaned each time after using, is one of the best strainers available. The strainer cloth should be rinsed in cold water, washed clean in warm water, scalded and hung in the sun, if possible.

Strain, and cool by placing the can in cold water and stir a few times within the first hour. Use a thermometer enough to know whether it gets cold or not. If necessary, change the water. It should be down to 50 degrees F. at least, and the nearer 40 degrees the better.

It is the *getting the milk cold* which counts, not the putting it in the water. A can of milk will cool faster in water at 45 degrees than in the air at 35 degrees.

Keep tight covers off the cans while cooling, to allow escape of animal gases and heat. No objection to light cloth cover to keep out dust and flies. Be sure the air is pure where the milk is exposed.

Do not mix warm milk with cold, as it will sour both very soon.

Handling separator-cream.—The same care and general plan should be used in handling separator cream, either for shipping or for the creamery. The separating should be done as soon as the milking is finished, as the milk is then usually warm enough to separate most thoroughly.

Cool and stir the cream immediately after separating. Do not mix warm and cold cream. Cool the warm cream first.

Keep the cream in cold water if possible.

Wash the separator thoroughly after every using, scalding with boiling water the last thing.

Washing the Milk Utensils.—First rinse with cold or luke warm water; wash thoroughly with water as warm as the hands will stand, using some good alkali washing powder, such as sal soda, Gold Dust, etc. Rinse thoroughly with boiling water and if possible place in the sun shine.

If wiped dry with a clean towel the tin will be brighter, but if made thoroughly hot by the rinsing, it will dry without wiping, will not rust and be cleaner than if wiped with a towel, which is damp and as unsanitary as it is frequently used. Use a brush, not a cloth, for washing tinware.

Cream Separation.—Milk is “an emulsion of fats in a watery solution of alkaline salts, casein and sugar.”*

Fat being lighter than the water or the solids not fat (sugar casein, etc.) raises to the top when allowed to stand in a vessel, and in so doing carries with it a little of the other solids not fat, and constitutes what we commonly call cream. The heavier portion gravity.

Cream Ripening.—Speaking generally the ripening of cream is all of the treatment it receives from the time the milk is drawn until it is churned, while specifically and commonly it is the particular treatment given the cream after separation to prepare it for churning.

The general market wants a butter with a flavor that can only be secured by ripening the cream properly.

Ripening is a souring of the cream. When cream or milk sours the milk sugar is changed to lactic acid, by lactic acid producing germ. The bacteriologist finds that there are several forms of lactic acid producing bacteria; also that some forms of bacteria produce acid without thickening or curdling; others produce the reverse; again some produce gas; while slimy or ropy milk, red, or sometimes called bloody milk are other products of bacterial growth in milk and cream. In general the changes which occur in milk are due to some form of bacterial life.

Bacteria are minute forms of plant life; they grow rapidly at a temperature of from 60 to 90 degrees; they require food and moisture like higher forms of plant life; they are prevented from growing by cold; are killed by moist heat, most of them by a temperature of boiling water; they may remain inactive for a long time, then grow rapidly when conditions again become favorable; they grow or multiply usually by division, which may happen every twenty minutes, or may require several hours; in the process of their growth they cause some change in the ma-

*Wing—Milk and its Products.

terial in which they are growing. It may be a useful or a harmful one for the dairyman.

The character of the change will be largely determined by the kind of bacteria present, whether from the dust of the air, dusty hay, the flanks of the animal, the seams of imperfectly washed utensils, from a good home made starter or a commercial starter from a pure culture. The change may be retarded by excluding bacteria, by stopping their growth with cold, or by killing with heat. The change may be hastened by introducing bacteria, or by a favorable temperature. The rapidity of the change will depend on numbers of bacteria present and whether the temperature is favorable to their rapid growth or not. In the farm dairy the ripening of the cream is usually brought about by the bacteria which accidentally gain access to the milk and cream and fortunately for the dairyman the lactic acid germs usually predominate, especially in the clean, well kept dairy.

An understanding of these principles should materially assist in the handling of dairy products to bring about desired or prevent undesirable changes.

The cream should be kept cold, below 50 degrees if possible, until enough is secured for a churning. It should then be warmed up to from 65 to 70 degrees and held until it becomes sour and has a pleasant acid taste; occasionally a little higher temperature may be needed. If the cream was sweet it will usually require 18 to 24 hours to sour it. No cream should be added to that to be churned for at least 12 to 18 hours previous to churning; during this period it should be stirred several times to insure uniform ripeness. When cream of unequal degrees of ripeness is churned, it requires a longer time to churn and there is a much larger loss of butter fat in the butter milk. When a layer of cream is seen on the butter milk that has stood, it is usually due to churning too sweet, or part sweet and part ripe cream.

At least two hours before the cream is churned it should be cooled to 50—56 degrees. If not too ripe it may be held at this low temperature for 12 hours. This cooling will do much to

make a firm butter. When it is difficult to secure the desired flavor or when undesirable flavors due to the kind of bacteria which predominate are troublesome, or when under cleanly conditions in very cold weather the cream does not ripen sufficiently or even enough, a starter may be used to advantage.

Starter.—A starter may be sour skim milk or butter milk put in the cream to hasten or control the character of the ripening.

Butter milk may be used when the butter made was of particularly good quality, especially if churning every day or every other day. A skim milk or home starter is usually more desirable. A home made starter is prepared as follows: Keep separate the milk from one cow, preferably one that has not been in milk long (the factory butter maker must select the milk of some patron who takes more than ordinarily good care of his milk); run it through the separator or set in a vessel by itself. Fill one or two fruit jars that have been thoroughly cleansed and scalded with this skim milk; place these in a pail or convenient vessel of water at a temperature of 90 degrees. In cold weather it may be necessary to warm the water up once or twice by adding hot water or otherwise. In from 18 to 24 hours, the milk should become nicely lobbared, like a soft gelatin, when it is ready to use. If allowed to stand until the curd becomes firm, it will cause particles of curd to appear in the butter. When ready for use it should have a pleasant acid taste, free from objectionable taints and flavors.

In preparing a starter of this kind it is assumed that lactic acid bacteria have gained access to the milk in sufficient numbers that by holding at a favorable temperature for their development they will predominate over the less desirable forms, especially those which thrive at low temperature. Experience shows this to be true.

A skim milk starter cannot be depended upon always. It is wise to prepare two jars and use the best one, or if not right, neither should be used.

Commercial Starters.—Several firms are putting on the market pure cultures of bacteria, known as commercial starters, which have been found to give very satisfactory results in the creamery where large quantities of butter are made and even a slightly increased price for the butter will more than pay for the time and labor required for preparing starters. Under ordinary conditions about 10 to 12 per cent of starter is sufficient, i. e., one quart of starter to two and a half gallons of cream. If the cream gets ripe too quickly use less starter, if too slowly a little more next time. Rules and suggestions for ripening cream are but little helps. Conditions vary so from day to day and month to month that only the person who uses judgment and close observation can be sure of the best quality of butter from day to day. It is uniformity of quality and product that holds the trade and commands the higher price.

The Churn.—The kind of churn which has no inside fixtures, but dashes the cream from one side or end to the other by the motion of the churn has proved most satisfactory.

The paddles, dashers, etc., of whatever pattern, are apt to hurt more or less the texture of the butter; also cause a loss of butter in the cream, which adheres to them and to the corners of the churn, especially when the cream is a little thick.

When the churning is done in such a short time it is claimed by admirers of many so called improved churns, it is usually at a sacrifice of butter fat left in the butter milk, even though it may not be apparent to the eye.

Wooden churns are to be preferred to metal; because of their getting loose in dry weather if not used frequently or properly taken care of, a steel barrel churn, tinned inside and painted outside, has been put on the market. The objections to it are that the cream warms up more easily when the room is warm and more butter will adhere to it than to the wood. Care must be exercised to wipe it dry or it will rust. On the other hand the cream might be kept in it till enough is secured for a churning, making one less vessel to care for.

The size of the churn should be such that it will never be filled over half full, and better if only one-third full. Where the ordinary churning amount to from two to five gallons of cream a fifteen gallon churn is a desirable size.

The speed of a barrel or box churn which revolves should be sufficient to carry the cream to the highest point allowing it to fall the length of the churn. If it is turned too fast the cream will remain in the ends; if too slow it will slip around and churn slowly. The agitation which results from concussion is more desirable than that from friction.

The time required for churning depends on the ripeness of the cream, the temperature, the fullness of the churn, the amount of agitation and the richness of the cream, and to a lesser extent, period of lactation, and feed. Quick churning usually means large loss of butter in the butter milk. Under ordinary conditions, 20 to 40 minutes is a reasonable length of time for churning and no objection to an hour if firm butter and thorough work are desired, especially if the churning is done with other than hand power.

Temperature.—The only rule which can be given is “churn at as low a temperature as possible and have the butter come in a reasonable time.” A high temperature makes quick churning, large loss of butter in the buttermilk and soft butter; a low temperature requires a longer time, makes a firmer butter and reduces the loss in the butter milk. While most cream can be satisfactorily churned in 20 to 40 minutes at some temperature between 50 and 60 degrees F., some unusual condition may require a little higher temperature or longer time. In the Experiment Station dairy, 54 to 56 degrees is the usual churning temperature. When gluten meal or feed is fed the churning temperature may be lowered two to four degrees, while if much cottonseed meal is fed it may be raised a little if the butter is slow coming.

The variations in the churnability of cream from different cows, and herds, from the same cows at different seasons of the year, and varying stages of lactation require some variation in the churning temperature. Use a thermometer; then if the butter

comes quick and soft lower the temperature of the cream next time. It is very desirable that the cream be held at the churning temperature for at least two hours previous to churning. The butter will be firmer if this is done. No objection to its standing longer if the cream is not over ripe.

Difficult churning.—In the winter when the cows are on dry feed and have been milking for nearly a year or more and give only a small amount of milk, it is frequently difficult to make the butter gather.

Skim as thick a cream as possible; ripen the cream as described elsewhere till there is a pronounced acid flavor; do not fill a barrel over one-third full and churn at a little higher temperature.

Color.—If selling butter to the general market, use color if necessary to make the butter about the color of June butter. For private trade, color or not, as suits the customers. The standard butter colors are harmless and tasteless in the quantity needed. The amount required is small and can only be determined by trial. As the color combines only with the fat, a rich cream will require more color per gallon of cream than a thin cream. The color should be added to the cream just before starting the churning.

Stopping.—Stop the churning when the granules of butter are about the size of wheat grains, float freely, standing partly out of the butter milk and separate readily from it.

If the butter comes very soft, cold water may be added when the butter begins to break. When the granules form small and refuse to "gather" and separate from the butter milk, a little strong brine made by dissolving dairy salt in cold water will usually help the separation of the butter from the butter milk. A little salt may be thrown into the churning, but it is better to use the brine. Of course much of it will spoil the butter milk for drinking or cooking.

Straining.—In drawing the butter milk from the churn it is well to strain it through a cheese cloth or hair strainer, which will catch the crumbs of butter that may otherwise be lost.

Washing Butter.—By washing the butter while still in the

churn with about as much cold water as there was butter milk or a little more, the buttermilk may be very thoroughly removed.

The washing removes the casein, curd, of the butter milk. The casein which may be left in the butter, spoils very quickly, hence it is desirable to have as little of it in the butter as possible.

A second washing may be required. Excessive washing should be avoided as it may injure the flavor of the butter. The temperature of the wash water should be a little, three or four degrees, below the churning temperature. If wash water is very cold, the outside of the butter granules are hardened while the inside remains soft, so that when salt is added it will not be evenly mixed through the hard and soft butter by the working. This uneven distribution of salt will cause mottled or streaked color in the finished butter.

Salting.—Only the best grades of dairy salt should be used for butter. It may be added as a brine after washing the butter. This method wastes a good deal of salt and is only desirable where a very mildly salted butter is wanted.

The salt may be sprinkled on the butter while it is yet in the churn, then revolve the churn a few times till the butter is partially gathered, and allow it to stand if convenient, for an hour or two, so the salt may become thoroughly dissolved, and finish working either by revolving in the churn or taking it out.

The butter may be removed from the churn while in the granular form; spread on the worker, and the salt sprinkled over it. Work a little to incorporate the salt and possibly allow it to stand a little while till the salt dissolves; then finish the working.

The amount of salt used must be determined by the demands of the market. For the general market one ounce of salt for each pound of unworked butter is about right. The main thing is to learn what the market wants and then adopt a method which will give uniform results. If it is not convenient to weigh butter and salt, use a small measure of salt for a certain number of gallons of cream. For hand separator cream this method will give quite uniform results.

Working.—The butter is worked to expel the surplus moisture, to incorporate the salt and to give the butter a compact body.

Overworking injures the texture and makes the butter appear greasy. When possible, it is desirable to work the butter a little and then allow it to stand for a couple of hours or until next day; then finish. If there is not a suitable place to keep the butter in between workings, it is better to finish it right up. The working should be stopped when the butter breaks, with a slight tendency to hold together or string out in short pin points. As soon as it passes the stage where it breaks with a clean break, stop working. More butter is injured by overworking than by insufficient working.

Package.—The package should suit the market. Pound prints (standard size $2\frac{1}{2} \times 2\frac{3}{8} \times 4\frac{5}{8}$ inches) are gaining in public favor very rapidly and are a convenient form for packing, for handling and for table use. Wrapped in first-class parchment paper and placed in a manilla wrapper, called cartons, good butter will command a fair price and in most markets, a cent or more above that which is equally good packed in jars or irregular packages.

If prints are to be packed in boxes immediately it will usually be better to wrap them in dry paper, while if they are to be handled or allowed to stand, the paper will stay in shape better if dipped in cold water before wrapping.

Do not use wax paper for butter. A strong dairy parchment paper is the best for the purpose.

Marketing.—Private customers who will contract for a regular supply at a fixed price are usually the highest price market available to the maker of first-class dairy butter, as the express charges, commission, etc., on comparatively small lots are too high to warrant shipping. While private customers pay the highest price for good butter regularly supplied, the time required in delivery and collections is considerable. Frequently a grocer who has the best class of trade will contract for all of the butter at a fair price. Uniform quality from week to week and regularity of delivery are essential if fancy prices are secured.

Weighing and Testing Milk.—One of the most important things which may be done to increase the profit from the milch cows kept on the farm is to know accurately how much milk and

butter they are producing annually. Each one must be fed a year no matter whether it is grain or pasture, and she should produce enough over and above cost of care and feed to make a reasonable profit.

While it may pay to weigh the milk of each cow at each milking, especially with pure bred dairy cows, it is often impracticable to do this, but it will pay every farmer to weigh the milk one morning and one night each month throughout the year and multiply this by the number of days in the month, and use this as a basis for estimating the year's production. Careful experiments show that this method will give reasonably close results. It has been repeatedly shown that even the person who is milking the cows cannot determine the relative amount of milk or butter produced by the several cows in a herd without the aid of scales and tester.

When the milk is made into butter or sold on the basis of the butter fat, a Babcock test should be used and an estimate of the yearly fat production secured. This may be done as follows. At the milkings, when the weighing is done, have a pint fruit jar or other convenient vessel for each cow that is to be tested. After weighing the milk, pour from one pail to another at least twice. The first milk drawn from the cow is very poor in butter fat, often testing as low as 1.5 per cent, while the last is very rich; the last pint or two may test as high as eight or nine per cent. In order to get a fair test it must be thoroughly mixed as described. A sample taken during the milking will not be a fair one. After thoroughly mixing, place a little in the jar, say three or four tablespoonfuls, at the second milking, add about as much more. From this mixed sample the small amount required for testing may be taken.

Directions for operating the test usually accompany the machine, only some suggestions are here given which may be useful. Any bright boy or girl, 14 or 15 years old, can learn to operate the test accurately with a little practice.

Mixing Samples.—Samples should be mixed by pouring from one vessel to another, immediately before they are measured with the pipette. Shaking the sample will some times churn

parts of the butter, especially if the sample has been warmed up, Pouring is the best way.

When lumps of cream are not broken up by pouring and the milk is not curdled, it will often help matters to warm the sample by placing the jar of milk in warm water a few minutes.

Composite samples may be taken when it is desired to test all of the milk produced in a week or two, but do not want to test each milking separately. They should be used at the creamery for determining the amount of fat brought by each patron. Taken as follows: Into a jar which has a tight cover, put a corrosive sublimate tablet, or small quantity of bichromate of potassium, and each day add a small amount of milk. Care should be taken to see that the new milk and any cream adhering to the sides of the vessel are thoroughly mixed by rotating rather than by shaking the jar.

At the end of the desired period test this composite sample in the usual way, with the pounds of milk given during the period covered by the sample, and the per cent of fat given by the test, the pounds of fat produced are easily determined.

In creamery practice, if the composite sample has not kept properly it can often be dissolved by putting a very little common lye into the sample when ready to test, and allow it to stand a short time, shaking it occasionally.

Test not clear, may be due to too strong acid, in which case use less of it, or allowing the milk and acid to stand before mixing. Particles of cork in the acid may do it. If acid is weak there will be a light deposit below the fat column; it may be avoided by using more acid.

Reading should be done from the lowest part of the bottom curve of the fat column to the point where the upper curve of the fat touches the glass. A pair of dividers may be used in reading. Spread the points as far apart as the length of the fat columns; then place the lower one on the zero mark, and the upper point shows the reading.

Fertilizing Material Removed in Farm Products.—The following figures are presented to emphasize the reason why it is

desirable to feed on the farm the crops that are grown upon it, and sell only live stock and dairy products, thus removing from the farm the minimum amount of valuable fertilizer elements and eventually returning to the land the major portion of the manure, solid and liquid, if properly taken care of.

The purchase of concentrated feeds, bran, linseed, cottonseed and gluten meals, brings onto the farm from \$10.00 to \$12.00 worth of these same valuable elements per ton of feed, about three-fourths of which goes into the manure.

An understanding of these facts suggests why dairying is one of the surest and quickest means of building up and maintaining the soils which have been depleted by continuous cropping.

To estimate the value of commercial fertilizers, the State Chemist values nitrogen at 15c per pound, phosphoric acid $3\frac{1}{2}$ c, and potash 6c per pound. These prices with table III in "Feeds and Feeding" as a basis for the fertilizer elements in the common farm products show that \$100 worth of the various farm products will contain nitrogen, phosphoric acid and potash worth as follows:

Product.	Market Price.	Value of fertilizing
		Material in \$100.
Roughness—		worth of products.
Oat straw at	\$3.50 per ton	\$99.65
Corn stover at	4.00 per ton	97.47
Wheat straw at	3.00 per ton	82.29
Timothy hay at	8.00 per ton	65.39
Grains—		
Corn at .....	.35 per bu.	64.30
Oats at .....	.20 per bu.	59.98
Wheat at .....	.60 per bu.	41.16
Barley at .....	.40 per bu.	33.95
Live Stock—		
Sheep at	3.00 per 100 lb.	11.44
Cattle at	4.00 per 100 lb.	10.41
Wool—unwashed at .....	.20 per lb.	6.69
Hogs at	4.50 per 100 lb.	6.59
Dairy Products—		
Milk at .....	.90 per 100 lb.	10.72
Cheese at .....	.10 per lb.	6.82
Cream at .....	.48 per gallon	1.05
Butter at .....	.20 per lb.	.11

In my institute work, I show the charts and say "If you can fix them in your mind, and mix these two feeds you will very materially improve what you are already doing.

On the other hand there are only one or two feeds that are so nearly balanced themselves in the way of chemical composition.

DISCUSSION.

Q:—About the feed values?

A:—That feeding subject is a large one. There is a sample ration that I figured out that shows a representative balanced ration. What is a balanced ration? It is simply one in which the chemical elements are present in such proportions as to meet the needs of the animal body. The chemist when he takes a feed to analyze it, puts it in the oven and dries it out. Then he analyzes the dry matter. All the different elements can be grouped into two groups. Those which tend to make fat and heat and those which make the lean meat and energy, the protein and carbohydrates and fat. In a general way, for every pound of protein we ought to have somewhere from five and a half to six and a half or seven of carbohydrates and fat. That is in the dairy cows ration. In corn, which you all know is the fattening feed there is 11 pounds of the fat making material. For every pound of protein we get four times as much carbohydrates and fat. I said the dairy cow wants about one to five and a half, some say six and a half. In order to balance up a ration you must begin with a feed that is too wide, not one that is too narrow. (Look at this chart.) There is a group of feeds that has too much fattening and not enough milk making. And here is another group which has too much lean making, casein, etc. There is all your farm crops. There are the bought feeds plus a few of the farm crops. I am not going far into balanced rations. Clover hay is the only one in that whole list, and blue grass is another one. Those two feeds are the only ones that are real close. If you have lots of corn fodder, don't feed all clover at one time and all the corn stover. Mix the two together. The

clover will help to balance. If you have to buy feed, don't buy bran and feed it by itself and then feed corn next, mix the two together as you go along. If you find that a good thing, then make the ration a little closer. You can't do it all at once. But there is not one of you who can't receive those two lists and mix the two together.

THURSDAY EVENING SESSION

By the President:—We are now going to hear from Iowa. We have heard from Nebraska, Kansas and Missouri and will now listen to Mr. Shilling, the President of the National Dairy Union.

ADDRESS.

By S. B. Shilling.

Mr. Chairman, Ladies and Gentlemen:—I always feel when I stand before an audience and am introduced with my multiplicity of honors that I am at a disadvantage. It takes the man so long to tell who I am that I lose time that I might be talking to you.

I feel that before I touch upon the subject I am to speak to you about, I must congratulate the dairymen of this part of the State of Illinois, for the wonderful record they have made in the dairy business.

I am informed that it has only been three years since they engaged in the dairy business, and that last year at the two condensers here they received 100,000 pounds of milk daily. It

seems almost impossible. I would like to tell that story in Iowa, but I dare not do it. We have been in the business for thirty years, and in certain parts of the state do nothing else, and we can't begin to show any such a record as that. When I was coming down on the train yesterday afternoon, I heard a story about Egypt and it illustrated your enterprise. It is a little bit different from the story about the man who died and thought he was in heaven, but was in the other place. This man died and really went to heaven. He was being shown around through the beautiful city by Peter, and commenting on the quietness and the stillness and beauty and happiness that seemed to reign supreme everywhere, and he came upon two or three men who had balls and chains on their legs. "How is this? I am content in this place, but to find a thing of this kind where everything is so quiet and happy and these men with balls and chains on their legs?" "Those fellows come from Egypt in southern Illinois and if we were to take the balls and chains off them they will go back," said Peter. The story was a good one to me. I never heard it before.

I don't know how to talk to you. I have been used to talk to people who produced milk for butter. I am not like the landlord who was in southern Colorado that said he had human nature down to so fine a point he could tell the political complexion of a man as soon as he came into the hotel. How he did it? He was a Democrat. If a Democrat goes into the wash room he wipes on the towel, combs his hair and empties the water and goes in and sits down at the table. If a Republican comes in he goes to the wash room and he combs his hair, but he goes off and leaves the water in the washbowl. If a Prohibitionist comes in he will wash in the water that the Republican leaves. But the worst that comes in is the Populist, he combs his whiskers and won't wash at all. I haven't got you people down just that fine as to know how to address you on dairy subjects, but am going to talk on a subject while relating to farming is entirely different, that is the war on milk products. It is a subject that is to you as interesting, and if looked at as it is in the butter producing part of the state is of more interest than any dairy subject that confronts us.

You have not followed with the same degree of interest the war that has been waged between the dairymen and the manufacturing of oleomargarine as if you had been in the same condition we were in. If you had watched with the same degree of interest, you today would be sitting on the anxious seat just the same as we are, not knowing whether to build new creameries and advance any further the dairy interests, or not. We are standing waiting for a decision of this question from the Supreme Court, which to the dairymen mean everything. You, as milk producers, are equally interested with us in this question. The fact is, if the oleomargarine people are successful in the suits that are pending today in which they knock out the law that has protected us for over two years, we have either got to quit dairying for butter purposes or go to turning our milk into condensers the same as you do.

The first that attracted the attention of the dairymen to this question was about six years ago. At one of the meetings it was said there had been an article that had been sold as a product of the dairy. I wish to make myself plain to you. We haven't got today any quarrel with the manufacturers of oleomargarine, nor we never have had, if they will manufacture and sell their product for what it is. That's all we have asked of them. We ask them not to sell their product for our product of the dairy, but for what it was, and it is their business just as long as they do this. It is as legitimate as butter.

But the fact is this. They manufacture their product to look like ours and sell it for our product. When I tell you that up to three years ago, the output of this product was 123 million of pounds, or one-fourth of the entire product of the dairies of the United States, you will understand. If it was one-fourth of the product, it certainly must have depreciated the value of butter one-fourth, that is fair and natural to conclude.

The National Dairy Union, of which I have the honor of being the head, was formed for the purpose of counteracting or compelling these manufacturers to sell this product for what it was, and I want to say this to you to show you what show a dairyman would have. Armour himself, when investigating the

matter, testified that it could be made and sold at a profit of seven cents a pound. The product to manufacture it out of was unlimited, the capacity was unlimited. You can readily see had there been nothing done, had they been allowed to go ahead and manufacture and sell without any restrictions, where would we have been. Every one would have been forced through necessity to go out of dairying entirely.

First, I will give you the proceedings as they took place. We first secured the passage of a law taxing their product 2 cents a pound. We thought we had thrown every safeguard around the dairymen, but we found that the profits were so large that they had an incentive to manufacture the product and sell it in violation of the law, and that our law was a dead letter. Then we secured the law we have now, in which the product colored to imitate butter is taxed 10c per lb., and uncolored reduced to 1-4 cts. No restriction now on the legitimate sale of their product, but places them in a position where, if they sell it for our product and color it, they have got to bring the price up to what butter is worth. It was our only salvation. It was the only way; it was forced upon us. We simply took it as a measure of self-protection. This work has been accomplished by the National Dairy Union.

If I could take time to tell you of the fight from beginning to end, it would take much longer time than I have got. I will say this: There never was a fight waged between two interests that was fought with the same degree of vigor, with the same vindictiveness as the two factors. It went through justice courts, circuit courts and now at last to the supreme court. Taken before the state legislature of every state in the union, and finally before the national legislature, where we got the law we have at the present time.

I will also say this for what we have accomplished. Where they had 123 millions of pounds, when this law was enacted, it fell to about 56,000,000 of pounds. Over seventy per cent of their product has been knocked out by this law.

Three weeks ago we succeeded in getting three suits before

the Supreme Court of the United States and these are still pending. They are the ones I referred to, on which we are waiting the decisions, and will decide whether we stay in the dairy business or whether we have got to give up the field to them. It depends upon these decisions. There are four other suits pending. They all will hinge upon the ones argued three weeks ago, except one.

There was five months of this time in last year spent in coloring their product with palm oil, and it was impossible for any chemical test we could submit it to to determine what they were using. During those five months one company alone failed to pay the government \$30,000 which after it was determined what coloring they were using, the government called for and forced them to pay. They paid the \$30,000, but commenced suit on the government for a return of this money.

That is another suit to test the law and nothing more or less than this. Arriving at the same results in another way. If they are successful in this suit, it nullifies the law we have now.

It has been no pleasure for the officers of the organization to keep up the organization. We formed for the purpose of protecting the dairy industry, and I know the officers were in hopes that at the end of the year we could close. We concluded that if we continued we must hunt for funds and put up a big fight. So we decided to incorporate. We did that within thirty days. It is now the National Dairy Union. We are incorporated under the laws of your state for the purpose of protecting the dairy industry and furthering the dairy industry in every way, shape or manner we can.

I make this statement to you. It has cost us over \$40,000 to accomplish what we have. It may seem strange to you to know where we got the money. We secured it from the dairymen of the country from subscriptions. Every creameryman from the west sent subscriptions in and that is principally the way the money was collected.

After we found it necessary to continue the work another year, we had to raise more funds. We asked all the best author-

ities in the country to contribute an article which they did. Ex-Gov. Hoard who was president of the Union contributed and we got an article from every agricultural writer of note in the United States, something from every dairy school, and if I had time I would tell you all about it. I will say this to you. There is not a book published today that has the same information between its covers that there is in this book, for the benefit of the dairyman. If I was selling the book for my own benefit, or the benefit of a company, it would be all right for me to say more, but it is bad taste to say more here about it. I am representing your business as dairymen; our money has been raised largely from the sale of this book. We sold nearly 20,000 in one year. That has been our principal source of revenue, and it is furnishing a large part today.

I could go on and show you and tell you of the work we are conducting at the present time, how the law is violated. Hardly a week goes over, but what our attention is called to violations of the law in which we have to spur on the people that enforce it to take the cases up and prosecute them. Last week two were convicted. Sometimes they get off and sometimes they get sent to the pen, if they persist after being warned. They are given every chance to change or quit. Last week one got a year and another six months.

All I want to say is this: It is a business you all are interested in. You are interested in the National Dairy Union; it is protecting you. We are fighting your battles for you and the only way to come before you and ask for your support is through the purchase of this book at \$1.00.

I won't take any more of your time. I am glad to have had an opportunity of telling you what this organization is. I thank you.

By the President:—I would like to say that possibly he might have some of these books.

A:—I have, yes sir.

It has some of the best knowledge you can get. You heard him speak of Gov. Hoard, and I believe H. B. Gurler has quite a piece?

A:—Yes sir.

By the President:—It relates to feed and feeding. It is a book that a man would want to take home with him.

FEEDING DAIRY COWS.

Prof. W. J. Fraser, Dairy Husbandry, University of Illinois.

1. Secure the rough fodders in the best possible condition and use them liberally, as they are much cheaper than concentrates.

2. Feed concentrates in proportion to the milk flow.

3. Study and supply the individual needs of each cow.

Before man had control over animals and they became domesticated there were no highly specialized forms, and when they roved wild on the prairies or in the forests, the problem of the particular kind and character of their food supply was not an important one for they were not expected to draw loads of several tons weight, or to produce the abnormal yields of milk that are given by the highly developed dairy cows of today. However, after man domesticated animals and began to develop breeds suited to special purposes, as draft, speed, beef, or milk, the question of their food supply became an all important one, for in order to secure the best results their food must be adapted to their special needs.

One fact of great importance, and which must not be lost sight of in economical feeding, is that the amount, kind, and character of the food an animal requires depends entirely upon the use to which that animal is going to put food. A cheap team may be kept through an idle time on a kind of feed that would not be at all suited to the needs of a race horse during the training season, or of a valuable cow yielding 100 pounds of milk a day during an official test.

In order that a cow may produce the greatest yield of which she is capable she must be given the right kinds of feed and the correct amount of each, or a loss more than proportional to the feed withheld will result in a decrease in yield. There is little use in paying high prices and establishing a good dairy herd unless careful attention is to be given to the amount and character of the feed, for however well bred and efficient the individuals they cannot give in their product what they do not receive in their food.

The nutrients contained in all feeding stuffs, as well as in animal bodies and in milk, may be divided into five classes as follows:

- Water,
- Ash, (mineral compounds).
- Protein, (nitrogen compounds).
- Carbohydrates, (starches, sugar, etc).
- Fats, (or oils).

While an ample supply of pure water is one of the first requisites of good stock feeding, it is usually supplied in abundance at comparatively little cost and will not be considered further in this discussion.

Ash or mineral matter is present in all feeding stuffs in sufficient quantities so that an animal properly nourished with the other constituents is sure to receive enough mineral matter; we will, therefore, pass that group of substances also.

Protein.

Protein is the name applied to the constituents of feeds which contain nitrogen, and feeding stuffs which are rich in this element are frequently called nitrogenous feeds. Among these are: Oil meal, cotton seed meal, gluten meal, and the legumes; as cow peas, alfalfa and clover. The white of an egg, the gluten of flour, the lean part of meat, and the casein of milk are all good examples of protein.

The principal use of protein in the body is to build muscles, replace their waste, and form casein in milk. There are two reasons why special attention should be given to the amount of

protein contained in the different feeds; first, because it is usually deficient, especially in feeds for dairy cows; second, because no other class of substances can perform the same functions.

Carbohydrates.

Carbohydrates is the name applied to the carbonaceous group of substances such as starch, sugar, and the woody parts of plants known as crude fiber. This group forms the larger part of the food consumed by animals, as we shall see later. Carbohydrates furnish heat to keep up the body temperature, energy to perform the body functions and the muscular activity, and if fed in excess of these demands fat may be stored up in the body. In the case of the dairy cow, carbohydrates, besides supplying the above requirements, furnish the constituents for forming milk sugar and fat in milk.

Fat.

Every one is familiar with fat in its different forms; as, tallow in the steer, lard in the hog, and fat in milk. In corn there is about 4.3 per cent of fat, or oil, and in flaxseed a much larger proportion, while in most of the rough fodders there is comparatively little. Fat in the food nourishes the body in exactly the same way as do carbohydrates, namely, furnishes heat and energy and forms fat. The chief difference between fat and carbohydrates is that the former is a more concentrated form of food, one pound being equal to 2.4 pounds of carbohydrates. It should be remembered that fat and carbohydrates are interchangeable, that is, whichever one is in excess may take the place of the other, but it must also be borne in mind that however great the excess of carbohydrates and fat in the ration, no more muscle can be formed in the body, or casein produced in the milk than there is protein in the food supplied. In other words, where protein is in excess it can take the place of carbohydrates and fat, but no amount of carbohydrates and fat can take the place of protein in the least degree.

Digestible Nutrients.

The digestibility of the different constituents of feeds is of great importance, as only that portion of feeding stuffs which passes into solution during the process of digestion and is absorbed into the blood is of value to the animal. This portion of the various feeds is known as the digestible nutrients.

The difference between the total nutrients and the total digestible nutrients is marked; for example, by referring to feeding tables we find that in 100 pounds of clover hay there are 12.3 pounds of protein, but of this only 6.8 pounds are digestible and can be used to nourish the animal. The digestible nutrients are, therefore, the only ones considered in making up rations.

Table 1.—Digestible Nutrients Required Per Day for a 1,000 Pound Cow for Maintenance and Following Yields.

Much careful study and investigation has been devoted to the question of determining amounts of digestible protein, carbohydrates, and fat needed for cows of different weights and varying yields. To Professor T. L. Haecker belongs the credit of securing the data from which the following table has been computed.

	Protein. lb.	Carbohy- drates, lb.	Fat, lb.	Nutri- tive ratio.
For maintenance. ....	.7	7.	.1	1:10.3
10 lb. milk 3% fat	1.10	8.81	.24	1: 8.5
10 lb. milk 4% fat	1:17	9.16	.26	1: 8.4
10 lb. milk 5% fat	1.24	9.51	.29	1: 8.2
20 lb. milk 3% fat	1.49	10.62	.37	1: 7.7
20 lb. milk 4% fat	1.63	11.32	.42	1: 7.5
20 lb. milk 5% fat	1.77	12.02	.47	1: 7.4
30 lb. milk 3% fat	1.89	12.43	.51	1: 7.2
30 lb. milk 4% fat	2.10	12.48	.58	1: 7.1
30 lb. milk 5% fat	2.31	14.53	.66	1: 7.0
40 lb. milk 3% fat	2.29	14.24	.64	1: 6.9
40 lb. milk 4% fat	2.57	15.64	.74	1: 6.8
40 lb. milk 5% fat	2.85	17.04	.84	1: 6:7
50 lb. milk 3% fat	2.68	16.05	.78	1: 6.7
50 lb. milk 4% fat	3.03	17.80	.90	1: 6.6
50 lb. milk 5% fat	3.38	19.55	1.03	1: 6.5
60 lb. milk 3% fat	3.08	17.86	.92	1: 6.5
60 lb. milk 4% fat	3.50	19.96	1.07	1: 6.4
60 lb. milk 5% fat	3.92	22.06	1.22	1: 6.3

In all animals there is a constant breaking down of the body tissues caused by wear, there is energy expended in keeping up the vital processes and in maintaining the body temperature. The food used to rebuild worn-out tissues and to furnish heat and energy when the animal is at rest, is called the food of maintenance. For a 1,000 pound cow this food of maintenance amounts to about .7 of a pound protein, 7 pounds carbohydrates, and .1 of a pound fat; as is given in the first line of Table 1. If a cow of this weight is producing 30 pounds of 4 per cent milk, she will require digestible nutrients about as follows:

	Protein, lb.	Carbohy- drates, lb.	Fat, lb.
For maintenance .....	.7	7.	.1
For 30 pounds of 4 per cent milk, (including main- tenance)	2.10	13.48	.58

A cow of the same weight producing 40 pounds of 4 per cent milk will require a ration containing 2.57 pounds protein, 15.64 pounds carbohydrates, and .74 of a pound fat. If her yield were 50 pounds of 4 per cent milk, her ration should contain 3.03 pounds protein, 17.80 pounds carbohydrates, and .90 of a pound fat.

In feeding dairy cows, the fact that they should be fed according to their milk production is frequently overlooked. A cow capable of producing 60 pounds of 4 per cent milk a day, must be fed a much larger amount of digestible nutrients, if she is to produce her greatest yield, than a cow giving only 10 pounds of milk testing 3 per cent.

This point should be strongly emphasized, for a cow cannot give in her product what she does not receive in her food. By referring to Table 1, the nutrients required for any yield of milk may be easily determined. If the cow weighs more or less than 1,000 pounds, a proportional increase or decrease in the food for maintenance should be made.

From the weight of a cow and the amount of milk she will produce on liberal feeding, the required nutrients may be determined. The next step is to select such feeds as will best supply

these nutrients. We will take, for example, a 1,000 pound cow producing 30 pounds of 4 per cent milk and by referring to Table 1, find that she requires 2.1 pounds protein, 13.48 pounds carbohydrates, and .58 of a pound fat.

If one wishes to feed clover hay and corn and cob meal, he can make up a trial ration by taking 15 pounds of clover hay and 8 pounds of corn and cob meal. The nutritive value of each of these feeds can then be determined from feeding tables which give the amount of digestible nutrients in 100 pounds of the different feeds. We find that 100 pounds of clover hay contains 6.8 pounds protein, 35.8 pounds carbohydrates, and 1.7 pounds fat. Dividing each of these amounts by 100 we have the digestible nutrients in one pound, multiplying by 15 we have the digestible nutrients in 15 pounds which is, 1.02 pounds protein, 5.37 pounds carbohydrates, and .25 of a pound fat.

In the same manner are found the protein, carbohydrates, and fat in 8 pounds of corn and cob meal. Taking the digestible nutrients in the given amounts of each of these substances we have the following ration:

Ration A.

	Lb.	Digestible Nutrients.		
		Protein.	Carbohy- drates.	Fat,
		lb.	lb.	lb.
Clover hay	15	1.02	5.37	.25
Corn and cob meal	8	.35	4.80	.23
<hr/>		<hr/>		<hr/>
Total nutrients in ration		1.37	10.17	.48
Nutrients required for a 1,000 lb. cow giving 30 lb. 4% milk		2.1	13.48	.58

By comparing the total nutrients in this ration with the required nutrients for a cow producing 30 pounds of 4 per cent milk, it is found that the ration is deficient in both protein and carbohydrates. To bring the nutrients up to the amount required we try adding six pounds of bran and the ration is then as follows:

Ration B.

	Lb.	Digestible Nutrients.		Fat, lb.
		Protein. lb.	Carbohy- drates. lb.	
Clover hay	15	1.02	5.37	.25
Corn and cob meal	8	.35	4.80	.23
Bran	6	.73	2.35	.16
Total nutrients in ration		2.10	12.52	.64
Nutrients required for a 1,000 lb. cow giving 30 lb. 4% milk.....		2.10	13.48	.58

The amount of protein, carbohydrates, and fat now correspond closely with the nutrients required, for all practical purposes.

If one wishes to feed clover hay, corn silage, corn meal, and ground oats, he can make up a trial ration by taking 8 pounds of clover hay, 40 pounds of silage, 4 pounds of corn meal, and 4 pounds of ground oats. The nutritive value of each of these feeds can then be determined from the amount of digestible nutrients in 100 pounds given in feeding tables. Taking the digestible nutrients in the given amounts of each of these substances we have the following trial ration:

Ration C (Trial Ration.)

	Lb.	Digestible Nutrients.		Fat, lb.
		Protein. lb.	Carbohy- drates. lb.	
Clover hay	8	.54	2.86	.14
Corn silage	40	.36	4.52	.28
Corn meal	4	.31	2.67	.17
Ground oats	4	.37	1.89	.17
Total nutrients in ration		1.58	11.94	.76
Nutrients required for a 1,000 lb. cow giving 30 lb. 4% milk.....		2.10	13.48	.58

By comparing the total nutrients in this ration with the required nutrients for a cow producing 30 pounds of 4 per cent milk, it is found that the ration is deficient in both protein and carbohydrates, but needs a larger proportion of protein than of

carbohydrates to bring the nutrients up to the amount required. Adding one pound each of corn meal, ground oats, and linseed meal, we have ration D, which is a good economical ration, and fulfills the desired requirements.

Ration D.

	Lb.	Digestible Nutrients.		
		Protein.	Carbohy- drates.	Fat,
		lb.	lb.	lb.
Clover hay	8	.54	2.86	.14
Corn silage	40	.36	4.52	.28
Corn meal	5	.39	3.34	.22
Ground oats	5	.46	2.36	.21
Linseed meal	1	.29	.33	.07
Total nutrients in ration		2.04	13.41	.92
Nutrients required for a 1,000 lb.				
cow giving 30 lb. 4% milk.....		2.10	13.48	.58

Balanced Ration.

If the protein and the carbohydrates are in such proportion as will best suit the needs of the animal, the ration is said to be balanced. If the amount of protein in the ration is small in proportion to the carbohydrates the ration is called wide; if the amount of protein is large in proportion to the carbohydrates, the ration is called narrow.

Since the needs of different animals vary greatly, it will be seen that a ration which is balanced for one animal or class of animals may be decidedly too wide or too narrow to be economical for another class. Young and growing animals and cows producing a large flow of milk require a much larger proportion of protein, or in other words a narrower ration, than animals after they have completed their growth, or cows when giving a smaller flow of milk, or entirely dry. The difference in the amount of protein required by cows giving large and small flows of milk may be seen by referring to Table 1.

In feeding dairy cows, several things must be considered besides the amount of digestible nutrients contained in the feed.

The ration must be palatable, and of such a nature that a cow can eat a sufficient quantity to supply her needs.

There is enough nutriment in 300 pounds of oat straw for a cow giving 60 pounds of 4 per cent milk, but it would be absurd to expect a cow to produce such a yield on oat straw alone, as her capacity could not handle more than one-tenth this bulk in one day. The concentrates, too, must be in the proper form to be best utilized by the cow. To get the most out of grains they should be ground for the mastication is seldom, if ever, complete enough to break all the kernels, and those passing through the digestive tract unbroken are of no use to the animal and are, therefore, wasted. This difficulty may be partially obviated by mixing the grain and coarse fodder together. By feeding oats in the sheaf, or in the form of hay, or by mixing chopped hay with the grain, it will be much more thoroughly masticated, as grain eaten with roughage passes to the rumen and is remasticated in chewing the cud.

Ration E—Roughage Not Palatable and Concentrates too Heavy.

	Lb.	Digestible Nutrients.		Fat, lb.
		Protein. lb.	Carbohy- drates. lb.	
Corn stover	10	.17	3.24	.07
Oat straw	7	.08	2.70	.06
Corn meal	8	.62	5.34	.34
Oil meal, N. P.	4	1.13	1.60	.11
Total nutrients in ration		2.00	12.88	.58
Nutrients required for a 1,000 lb. cow giving 30 lb. 4% milk.....		2.10	13.48	.58

It will be seen that this ration is correct so far as the chemical composition is concerned but that the roughage is lacking in palatability so that a cow will not relish it, and the concentrates, while highly nutritious, are what dairymen call too heavy. Oil meal is so highly concentrated that it should not be fed in large quantities. This ration should be lightened by adding some light bulky concentrate, as bran or ground oats and made more palatable by substituting oat hay for oat straw. After making these

slight changes we have ration F., which is lighter and more palatable yet contains practically the same amounts of the different digestible nutrients.

Ration F.—An Economical Ration.

	Lb.	Digestible Nutrients.		Fat, lb.
		Protein. lb.	Carbohy- drates. lb.	
Corn stover	10	.17	3.24	.07
Oat hay	7	.30	3.25	.11
Corn meal	6	.47	4.00	.26
Bran	6	.73	2.35	.16
Oil meal, N. P.	1	.28	.40	.03
Total nutrients in ration		1.95	13.24	.63
Nutrients required for a 1,000 lb. cow giving 30 lb. 4% milk.....		2.10	13.48	.58

Examples of Practical, Economical Rations.

The rations given below are compounded so as to be palatable and at the same time have the proper chemical composition. They are suited to the needs of a 1,000 pound cow giving 30 pounds of 4 per cent milk, the same as the preceding ones; the requirements being 2.10 pounds protein, 13.48 pounds carbohydrates, and .58 of a pound fat.

Ration G.

	Lb.	Digestible Nutrients.		Fat, lb.
		Protein. lb.	Carbohy- drates. lb.	
Clover hay	12	.82	4.30	.20
Corn silage	40	.36	4.52	.28
Corn meal	2	.16	1.33	.09
Oats	2	.18	.95	.08
Bran	2	.24	.78	.05
Gluten meal	1	.26	.43	.11
Total nutrients		2.02	12.31	.81
Nutritive ration—1:7.5.				

Ration H.

		Digestible	Nutrients.	
		Protein.	Carbohy-	Fat,
	Lb.	lb.	drates.	lb.
Corn silage	30	.27	3.39	.02
Cowpea hay	7	.76	2.70	.08
Oat hay	7	.30	3.25	.10
Corn and cob meal	5	.22	3.00	.14
Bran	3	.37	1.18	.08
Oil meal	1	.28	.40	.03
Total nutrients		2.20	13.92	.45
Nutritive ratio—1:6.8.				

Ration I.

		Digestible	Nutrients.	
		Protein.	Carbohy-	Fat,
	Lb.	lb.	drates.	lb.
Corn stover	10	.17	3.24	.07
Clover hay	8	.54	2.86	.14
Oat hay	8	.34	3.71	.12
Corn and cob meal	5	.22	3.00	.14
Bran	2	.24	.78	.05
Cotton seed meal	2	.74	.34	.24
Total nutrients		2.25	13.93	.76
Nutritive ratio—1:7.				

Ration J.

		Digestible	Nutrients.	
		Protein.	Carbohy-	Fat,
	Lb.	lb.	drates.	lb.
Corn stover	10	.17	3.24	.07
Cowpea hay	10	1.08	3.86	.11
Corn and cob meal	7	.31	4.20	.20
Bran	4	.49	1.57	.11
Total nutrients		2.05	12.87	.49
Nutritive ratio—1:6:8.				

The farmer should, as a rule, aim to raise the greater portion of the feed for his stock on the farm. Since rough feed is usually much cheaper than grain, too much importance cannot be placed

on securing hay and fodder in the best possible condition. If hay is unduly exposed to dew and rain during the time of curing it loses much, both in nutrition and palatability. It is also important that hay and fodder be cut at the proper stage, before becoming too ripe and the stems woody.

Leguminous plants, (those bearing their seeds in pods or legumes), as clover, alfalfa, cow peas, beans, etc., are rich in protein and should be raised in sufficient quantities to supply the necessary protein for the stock. If the supply of protein is deficient some feed rich in that substance should be purchased to complete the ration.

Grain feed should not usually compose over half the ration, and from that to nothing according to the character of the roughage available and amount of milk being given by the cow. In general it is a safe rule to feed liberally on good roughage and vary the grain feed to suit the requirements of the individual.

When cows have luxuriant pasture during the late spring before the heat is excessive or flies troublesome, the conditions are as near ideal for dairy cows as it is easy to obtain. The nearer we can approach this condition the year around the better for milk production. It is, therefore, essential to the best yields and most economical results, that succulent food be provided for cows during the winter months. There are two ways of providing this succulent food,—by silage and by root crops.

By comparing the results obtained at several different experiment stations it is found that corn commonly yields about twice as much dry matter per acre as root crops. Since roots require much more hand labor, which is so expensive in this country, it is more economical for the Illinois farmer to get the succulent feed during the winter from the corn silage than from root crops.

Silage is especially valuable on farms or in communities where rough feed is scarce, for more stock can be kept on a given area of land with the silo than in any other way, with the same amount of labor expended. No farmer keeping ten or more cows can afford to be without a silo.

Green Feed for Summer Drought.

Dairymen suffer greatly nearly every summer by not supplying proper green feed for their cows during the hot dry weather of midsummer. This shortage of feed comes at a very inopportune time since the cows are already beginning to feel the effect of the heat and flies which of themselves quite imperceptibly lessen the flow of milk, and if feed is cut short at the same time the shrinkage is certain to be large. The flow diminishing at this time of year is a great loss because it is practically impossible to restore the shrinkage during that period of lactation. A continuous supply of feed is equally essential to the successful maintenance of young and growing animals.

A pasture will carry much more stock during spring, early summer, and fall, than it will in the dry weather of midsummer. By helping it out during this season with partial soiling, the cattle have better feed and more stock can be carried on a given area than by pasturing alone. Feed may be supplied in two ways, either by growing some crop that can be pastured off by turing on the cows a short time each day or by cutting the crop and hauling to the cows in the stable, yard, or pasture. The former method is the more economical of labor, but there is greater waste of feed and it requires either a small field or some temporary fencing. Such crops should be planted as will mature in proper succession with each in its best stage of growth insuring a continuous supply of green feed during the dry season.

Crops for Partial Soiling During Midsummer.

Kinds of Fodder.	Amount of seed per acre.	Approximate time of seeding.	Approximate time of feeding.
1. Corn—early, sweet or dent.....	6 quarts.	May 1	July 1—Aug. 1
2. Corn—Medium dent	5 quarts.	May 15	Aug. 1—Sep. 30
3. Cowpeas	1 bushel.	May 15	Aug. 1—Sep. 30
4. Soy beans	1 bushel.	May 15	Aug. 1—Sep. 15
5. Oats and Canada peas (each)..	1 bushel.	Apr. 15	July 1—July 15
6. Oats and Canada peas (each)..	1 bushel.	May 1	July 15—Aug. 1
7. Rape (dwarf Essex)	4 pounds.	May 1	July 1—Aug. 1
8. Rape, second sowing	4 pounds.	June 1	Aug. 1—Sep. 1
9. Rape, third sowing	4 pounds.	July 1	Sep. 1—Oct. 1

For central and southern Illinois there is no crop that will produce more feed to the acre than corn, and by planting a small quantity of an early variety with the general crop, corn may be had in the proper condition for feeding from July 15 until frost. There are several early varieties that will mature for feeding in from sixty to seventy-five days after planting. Corn should not be fed too young. When it is nearly full height it contains only one-third as much nutriment as when in the roasting ear.

Some other crop should be fed in connection with corn to balance the ration and afford variety. Leguminous crops as clover, Canada peas, cow peas, soy beans, etc., are especially valuable for this purpose, being unusually rich in protein.

Cowpeas and soy beans give a large amount of valuable forage, furnishing feed from the first of August until frost. If more feed has been grown than can be fed green, it may be made into hay of excellent quality.

Oats and Canada peas yield well. They are not in condition to feed for more than two or three weeks, but the supply may be lengthened by sowing at different dates. If a portion becomes too ripe it may be utilized by making into hay.

If the pastures are short and no allowance has been made for green feed, corn cut from the regular crop, if it is near the roasting ear stage, will bring the best of returns. Never under any consideration allow the stock to go hungry and suffer the losses incident to shortened feed at the time which is for every reason the most trying to live stock.

This is an elementary presentation of the subject of feeding and those who wish to study it further are referred to some of the standard books on feeding; among the best being "Feeds and Feeding" by Professor Henry, director of the agricultural experiment station at Madison, Wis.; and "Feeding Farm Animals" by Dr. Jordan, director of the agricultural experiment station at Geneva, New York. The former gives a very complete description of the feeding of all classes of farm animals, and also a compilation of the results of feeding investigations, both in this country and abroad; the latter is a well written popular treatise upon the subject of feeding.

By the President:—When introducing the last speaker, I said we had brought prominent men from several of the states who were up in the dairy business. We will now close the convention with a gentleman from your own town. We propose to have the last paper from a gentleman from Greenville. They are good men and he can tell us something we want to know. We have told of things done in other states, and we want to know a little more of what you can tell us here.

PEAS AS FEED.

By Mr. Geo. Grube, Greenville, Ill.

Mr. President:—I am not prepared with a paper, and am not physically able to talk very long.

As I look over this audience, I see most of the people are from Bond County. I doubt if there is a man here who hasn't been corralled by me on the street and talked peas to until he wished I would shut up and let him go home. But cow peas, I think, have been part of the redemption and prosperity of Bond County.

We labored along here for years trying to get a strain of clover on our land. We knew that that produced nitrogen and nitrogen would enrich our soil.

I have been raising cow peas on my place for seven or eight years, and I studied the soil and will give all the information I can from my experience, and I don't know it all yet.

As to the value of peas: Now, cow pea hay contains, we will say, 10 per cent protein. If we grind that up, we would have it pretty nearly as rich as bran; bran contains 15 per cent protein.

One trouble is, we feed too much cow peas. There is not a man but who has made that mistake. He throws a manger full of

cow pea hay, just the same as he did a manger full of timothy hay, which I consider as good as so much fine shavings to feed to a milk cow. The consequence is, the cow roots around, picks it over and gets the pods, and they say the cow wastes it.. We don't get the number of tons to the acre of other stuff. The reasons we don't get the results, is because we have fed into the cow more protein than her system can assimilate and consequently it just floats off and is wasted.

Pea hay is the best food we have for milk. It stands 10 per cent protein, clover hay 6 per cent and oats hay 4 per cent. That is the relative values. If the farmers would feed this in smaller quantities we would get a better result from it, than we would from feeding so much of it. We would be better satisfied with the smaller yield as well as being satisfied with the results that we get from the peas as a fertilizer on our ground.

Of course I was put on this program to talk about peas as feed. I was not consulted on that question. I would rather draw out discussion. I would like to have questions asked and sit down and listen to them. If I could stir up a hornet's nest of discussion, I would think I had done something.

The uses of cow peas are so many, I think if I were to try and go through all of them, it would be a long talk. You people are my neighbors here, know that that is the situation.

There is one thing I want to say about cow peas and corn together. There are some, maybe, who have not heard me talk about that. You know I advocated planting corn and peas together. That is a combination, I feel is going to be worth some ones talking about. I contend this, to plant peas with the corn is good, while I am not willing to say that it is the way to do to to mix peas and corn together, that part I don't approve.

In the absence of a planter with two sets of boxes on it, so peas come out of one box and corn out of the other and marking along the same row, have a check managed so the corn and peas will drop out in the same hole, will be about the same thing. If we had a machine of that kind it would pay for itself the first year, you could throw your planter away. I contend it is worth all it costs for any of three things, as a fertilizer for your ground,

it is worth all it costs as a moisture retainer for that corn in August and September when ordinarily if we have the corn clean the ground is dry as the roads, and it is worth ten times what it costs because it will only cost 20 per cent an acre, figuring on last year's prices of \$1.60 a bushel and using a gallon of seed to the acre. They tell me I advocated too much seed to the acre, and it is valuable for a preventive for chinch bugs. When prevention grows under that corn, you are going to have something that will prevent the second crop of bugs from doing harm, and that is the crop of bugs that does harm in this country. The first crop of bugs comes and swipes every thing and we have got time to put something else on that ground. The second crop no man can fight against it. Those who have studied bugs and worms, etc., know that any of the chinch bugs don't do anyone any harm the first time, but the potato bug, those little ones, are suckers, they never seem to get filled up. They suck the life out of the corn.

Now then about conditions: I don't know whether you noticed it or not, but if you noticed it in the fields around in this county, that wherever there had been peas planted in the corn, the bugs didn't do the damage there.

My object first was to raise this in this combination so that I could be building up my land and not be tearing it down entirely, but if you must do it and want to take everything off, take a McCormick Corn harvester. I know of fields that have been cut with it and I have passed along by those fields and saw it was taken up so clean that you wouldn't know there had been any cow pea there. I told a gentleman about this combination and about them taking this corn up. He said he was there when they were shredding that fodder and it was the prettiest lot of feed he ever saw. The fellow told me he had two or three tons of pea hay in that corn, but he got a whole lot of feed. But of course this is a hobby of mine.

I have been interested in helping the farmers in this county as much as possible. I got a couple of car loads of cow pea seed and brought it down here in car load lots and made a small mar-

gin on it, as reasonable as a man could afford to do it in place of letting it go to St. Louis and have another local freight rate and another retailers profit to pay. I suppose that some of the people here thought I was not doing all I could do last spring, but I did. I got over 100 bushels black cow peas.

I have studied all kinds of peas. I have had as high as 10 or 12 different kinds of peas growing in one field and studied them. I have selected the black pea as being the best one for this purpose, for this reason, they will produce more hay.

Q:—Is that the Whippowill pea?

A:—No sir. That is nearly a white pea.

The black pea is just as black as coal. What led me to this conclusion is this. I have planted the black pea more or less on my own farm for six or seven years, and I never have any one year failure and that black pea comes up all over the ground. That is not any particular advantage anything more than that they are a hardy pea. I have tried others, and the Whippowill never came up.

Q:—What did that come from?

A:—It came from the seed.

Peas should be put in not before the first of June. There is not any rule to go by I know, but I know that that is so. From the first of June to the 25th of June. Any one who thinks they are going to get their peas matured early by planting them early may hit it one year in ten, but they will be lucky if they do that. The black pea is selected on account of its hardness.

Q:—How do you prepare your soil?

A:—Our soil is prepared in just as nice a seed bed as possible. There is another rule that will hold good. The better seed bed the better the crop.

Q:—Do you put it in deep or shallow?

A:—Not necessary to plow deep for peas.

Q:—How much seed to the acre?

A:—I have always used about three pecks to the acre.

Q:—Do you sow them broadcast?

A:—That will depend on the season. He must know something about the weather at the time he plants. Three or four

years ago I put in 65 acres and I drilled them, thought I couldn't do them any other way. And I walked behind that drill and drilled them. It was a wet season, and it was a pretty expensive lesson. I think one pea out of ten came up. If I had sown those peas broadcast, I would have had five times the amount of stull on that ground. The next year I said, "I am not going to fool with this drill, I will sow the peas broadcast." The ground was so dry when I sowed them and stayed dry and I think some peas were laying there when I cut the grass.

Q:—Don't you think you planted some too deep with that drill?

A:—Yes sir, that may be so. It was a very wet spring. We would get a chance to work for a day or half a day then it would come on to rain. Now, peas are a peculiar thing. I know a story of a man who planted some beans in his garden and some of his friends asked about his garden. He says, "Everything is coming along but the beans, but the dammed things keep coming up and I have to push them down every morning." Well cow peas are not peas at all they are beans. You plant a pea in the ground and it sprouts up like corn and we don't care anything about that pea, but you plant a bean, and that bean will lay in the ground just like that and got to come out between these lobes and they will drop off. If you plant that bean in the ground and it can't get up there it will commence twisting up and finally the head of the bean itself will come in there and this sprout will surl up and try to push and push and the next thing you know it has pushed its head off and it is dead. That is the end of that. There is a whole lot to understand about cow peas and yet we can't get it all. I do believe this, that cow peas are of such a good character for our soil and are undoubtedly the finest milk producer of anything we can raise, that it is worth all this effort to try and make a successful crop of it.

DISCUSSION.

Q:—I think probably you might leave an impression that to sow beans broadcast any year is all right?

A:—No sir. Whenever the ground is dry and the prospects are for dry weather, then get your peas under the ground. In the dry season the nicest thing to plant peas with is a planter and the ground pressed on it. In a wet season—that is the worst. There is one thing, no one can tell what to do with the next year. As I said awhile ago, if a wet season and the ground is wet, it don't take hardly anything to sprout a pea and it will come along all right. Sow broadcast in wet season. Or, if you have an oat seeder, you can use that.

Q:—How about planting in connection with corn, and not planting till June, won't do to leave corn to that time?

A:—I spoke of not planting until the 1st of June for the general hay crop, where we don't cultivate. The Arkansas Experiment Station three years ago started in and they planted. One said "We are not on the right track for raising peas here at all, but we haven't the right kind of machinery and we don't like to handle a hoe." Yet one man told me he could make \$5.00 a day cutting peas with a hoe. The Arkansas people planted a peck to the acre, two peck, three pecks and up to eight pecks, planted in rows 30 inches apart and cultivated them. Anyway, when they harvested that crop, where they planted a peck to the acre they had 31 bushels and some pounds of seed and over 3,000 pounds hay to the acre; where two pecks, they had 28 bushels seed and less hay, and so on it went, and where they had 8 pecks to the acre and cultivated they had 11 bushels of seed, 1,300 pounds hay. That don't look reasonable and yet that is just on the surface. When we stop to consider that if we plant corn the same way we would get about the same results. It goes to show what they have. A peck to the acre they have an average of 110 plants to the 100 feet of row. Where 8 pecks they had nearly 1,000, nearly 900 plants to the row. I believe that the time will come when we will find it to an advantage in our county to plant peas in rows $2\frac{1}{2}$ or 3 feet apart and cultivate them. We will have to have some machinery to work with. We won't work by hand in this county. I think that in course of time we can get a one-horse machine so one horse will break between these rows and a shear on each side like bean cutters in New York state.

Q:—Got one in Bond County?

A:—Who has it?

Q:—I have it. It pulls them up. I am quite an inventor myself. I worked on the sugar bean for a few years and nothing harder to cut than that.

Cow peas are easier to cut than the white bean. Another thing about using three pecks to the acre. Our soil is not rich enough for less, three pecks is enough.

Q:—Can you cut peas with a mowing machine?

A:—No sir.

Mr. Cobb:—I was in the best section of the United States for peas. I was in a portion of eastern Tennessee which ships out more peas than any town in the United States. The peas are all cultivated in rows, cut with mowing machine for hay, cut with Deering Binder and mowing machine. Some one made the remark here yesterday that cow peas could not be raised in the north. They have cow pea hay in Wisconsin in abundance. That is a good ways north.

Mr. Grube:—One thing bothers us in this country and one thing that retards the introduction of the cow pea in this county and the results on it, and that is in getting southern grown seed. I have gotten over that a little now. When I want hay, I don't know but what I would rather have southern grown seed. That will always develop, but I would like to have that southern grown seed in some year when we don't have a frost the 15th of September and a long rainy spell right after it.

Q:—Is that in Bond county?

A:—Yes sir.

Q:—Thought you didn't have any rain here?

A:—Yes sir, we do.

Q:—In regard to the planting of peas on black soil or light land?

A:—Yes sir. The better your land is the better the yield will be.

Q:—Can you cultivate and succeed in getting the pod?

A:—You can't get a seed crop. Castor beans, clover sugar beans all belong to the leguminous family. A man can plant Castor beans on rich land and you get great big bunches and no bean. You are liable to get a bean that is 18 inches long.

Q:—I have succeeded in getting a heavy crop.

A:—That's what I say, the richer the land the better the crop.

Q:—When the cow peas are planted, they spread out on the ground and waste in the harvesting. Wouldn't it be better to sow broadcast on that account?

A:—Well yes.

Q:—Couldn't they bear seed in a dry year if sown broadcast?

A:—Yes, it is only getting them in.

Mr. Lindley:—Last year and year before last McNeil who sowed cow peas in the corn, when about this high (indicating with hand) took a corn drill and drilled it in and raised quite a crop of cow peas in the corn. He made corn and pea hay and is now feeding it to sheep. As the result of mixing the peas with the corn, he has the best yield of corn in this section of the country, down south here. It will pay every farmer in this county I believe to sow every acre of land he puts in corn with cow peas.

Mr. Grube:—Select a hardy variety of pea. The black pea has proven itself to be a hardy pea.

Mr. Newman:—Will you plant it with the corn?

A:—Yes sir, the same time. Then I would rather have one gallon seed to the acre at that time than what three pecks of seed would make in ordinary average years planted at laying by time.

Mr. Lindley:—This year I took a field and planted half a bushel to the acre, three pecks to the acre and a bushel to the acre and made twice as many peas to the bushel to the acre without corn. Another thing about sowing peas. We have sown from 100 to 140 acres of peas the last three years and it is this, never broadcast a pea in the world. If wet weather run drill very shallow. If dry, a little deeper and I would use common

seeder to put it in with the drill, but I would never broadcast it.

Mr. Grube:—I will not disagree with you.

Mr. Lindley:—It is worth two or three dollars an acre when you can raise the crop. There are years when you plant the peas and they will not come good, but as a general rule you can get a good crop and I have done it for three years, and think it is a good thing to do.

Mr. Grube:—Take the black pea, 1-3 cow pea and 2-3 corn. I have seen it cut and it makes an elegant crop and shred it and it makes the finest feed in the world.

Mr. Cobb:—Commercial nitrogen costs 15 cents a pound. Peas will put nitrogen into the soil at the rate of 1 cent a pound.

Mr. Grube to Mr. Stoker:—Tell about planting corn and peas together.

Mr. Stoker:—I could not tell you a great deal about it. Where I got the start of that, a man in the eastern states has done that and increased the corn 25 to 50 bushels in five years and so I got to thinking it might be a good thing and Mr. Grube advocated it too. I think I was the first man that did it. I tried it and it was a grand success.

Mr. Newman:—You are keeping it up?

A:—Yes sir, $\frac{1}{4}$ peas and $\frac{3}{4}$ corn and I got good corn and good peas, 50 bushels to the acre and we shredded it.

Mr. Lindley:—Did you not thresh peas that was planted in the corn this year?

A:—Yes sir, we had no binder and I cut the corn and cut by hand and the peas cut and I got 12 loads from 12 acres. I got 21 bushels seed out of 12 acres.

Q:—How much corn?

A:—Late corn made about 30 bushels, but the first year I did that I could take out plants that had 60 pods on it.

Mr. Grube:—I give Mr. Stoker credit for doing something that I would not do. I am willing to divide honor with any one. Mr. Stoker went to work and mixed his corn and peas in the planter box. I would not do that until I saw some one else do it.

Q:—When raising peas for hay, I used one bushel and a

half to the acre and I got two tons of hay and the land was farmed to death. People told me I could not raise anything on it, and I got two tons of cow pea hay off of it.

Mr. Grube:—Just one thing and that was I used a planter with two sets of boxes.

Mr. Lindley:—I have ordered one.

Mr. Stoker:—I am going to check the corn and plant the peas and put the rows east and west; plant corn and drill peas right behind.

Mr. Grube:—That is something I shall have some other man do before I do. No one can drive the team over the same line straight enough so as not to interfere with the cultivation of the corn.

Mr. Stoker:—If a man can't drive any better than that he better go to agricultural school and learn to drive.

Q:—Those peas which he planted in his corn I am satisfied many and many of them were 16 feet high and I never saw the like and the corn was 10 feet high.

Mr. Lindley:—And the half has not yet been told.

Mr. Brunson:—I saw some corn that was raised on Seaman's land out east of here in which the corn was planted and cultivated with the peas at once, and then run the planter right along as close as could be and put the cow peas in there and the cow peas run above the corn. I understand where they had been putting in both cow peas and corn in the same box, it was pretty hard to keep them divided up; where drilled along the side of the road it did not interfere with the corn and the corn will start first. I followed up and saw where peas and corn with wheat plowed under and corn planted, cinch bugs ate the corn. But where no corn they stayed on the ground. I am going to plant sweet corn very thick and cultivate it once and then drill cow peas right side of it to hold the cow peas up. That is what is needed, something to hold the cow peas off the ground.

By the President:—Is there anything further to come before this convention?

Mr. Lindley:—In behalf of the dairymen and the citizens of

Greenville, I wish to return our thanks to this Association for holding their meeting here. I think it has been very profitable to our community, and we invite you back here as often as you will come. I assure you the dairymen here knowing now what a State Dairymen's Association means, and knowing the program, we would have to have a hall three times as large as this to hold the number of men who would be in attendance. We appreciate very much your coming here, and on behalf of the citizens I extend a hearty invitation to return whenever you please.

Q:—Wouldn't it be profitable for the milk men of Bond County to have a County Farmer's Association? We ought to talk about it now.

By the President:—I would throw out a suggestion. When you hold your County Farmers' Institute take that matter up. I don't know whether all these gentlemen here all come from Bond County. Organization is a grand thing for a body, whether agricultural or anything else. It would be good to have a good strong township organization, then a few county organizations around you and form that into the state association. We could become a bond that no one could break through. I think your suggestion a good one. You ought to take it up and carry it forward.

Mr. Lindley:—Last year we had two or three meetings. They were very good and very beneficial and it was suggested that this year we proceed along the same lines of instruction, and when we found that this meeting was coming here and men were coming from the university and from different states and were going to talk upon these same questions, it was talked over and several thought it over and decided it would not be necessary to hold the meetings because each one cost some money, and my experience was that the last two we had, I footed most of the bill myself for the speakers who came here, but that is all right. We could hold out meetings, but it seems to me that everything has been covered at this convention. They are expensive. We ought to hold them every year, but this meeting has taken the place of them. I think as far as an organization is concerned it

would be useless to have it here now, but next winter we could organize for two or three meetings and then you can talk it over.

By the President:—Don't get too narrow in your organizations. You ought to have a farmer's club. Dairying is only one adjunct of agriculture; have stock feeders as well. You can find things in dairying that the hog man and steer man can have, and have a good meeting with all of them. The agricultural people want to stand together, I always advocate that. We can teach each other something; don't get narrow. Other men and other farming is just as good.

In closing, I want to thank the citizens of Greenville and the citizens of Bond County and surrounding counties for the grand convention we have had. We haven't had a convention during the past three years that has given me more pleasure than the one you have given us in Greenville. This hall has been full every day with farmers. That is what we went. I like the word "farmer." Our friend from Indiana said "farmer is a pretty good word." I don't care if you have 1, 10 or 50 cows if you will have that one cow good and the 10 and 50 the same. That is the line we are all working upon. Creep up the ladder; discard your poor crop. Look up your ration and feed economically. We are in this business for the dollars and cents there are in it. We want to save what money we can and we want you to tell us what you have done.

I thank you for the association for the kindly manner and especially indebted to my good friend Mr. Lindley for the association meeting here. We were due to meet in the northern end of the state, but he was very kind to us last year in the legislature and it was our duty to come and help you out in Bond County if we could be of any help to you.

Gentlemen I thank you for the association and will call the meeting adjourned from this time.

The convention stands adjourned.

SILO AND SILAGE NOTES.

By A. J. Glover.

It is more than a quarter of a century since the American farmer began to can some of his green crops in a vessel, called a silo. There has been much written and a great deal of experimenting done to prove the feasibility of preserving some of our green food in this manner. There is no longer any question, but that this method is one of the best as well as the cheapest ways that we have of storing some of our green crops.

In the beginning many ill-constructed silos were built and extravagant claims were made for their use. In many instances the silage was very poor in quality, which led many thoughtful and conservative people to condemn the silo. Since we have learned how to construct properly these buildings and have also learned how to fill them properly the prejudice and suspicion are fast disappearing and silos are being built in every part of the country where live stock is kept. The silo has become a permanent factor in American husbandry and the time is not far off when the stock raisers, as well as the dairyman will depend largely on the contents of the silo for green feed. The progressive dairymen have long realized the value of succulent food for their cows, and they have been using silos for many years. It is the more conservative farmers who are now rapidly becoming converted to the use of silage, and are making inquiries in regard to the building of silos, what crops to put in them, how to feed silage, what it costs to fill the silo, and many other questions pertaining to this method of preserving feed. These questions have led the writer to prepare these notes on the silo and silage.

Style of Silo.

It is a settled question that the silo should be built round, for in a building of this shape the silage is best preserved. In a

round structure the contents settle more evenly than in any other shaped building, and if the corn is properly put into the silo the material is nearly as good next to the wall as it is in the center. It is not always so with the square structure, the silage in the corners of a square building is apt to be very poor in quality, and often unfit for feed. Since the round building is the best form to construct the next question to consider is what kind of a round silo should be built? The stave silo, which is manufactured by a number of firms, makes a very satisfactory building, and one that lasts for many years. Farmers who have built the stave silos are well pleased with them.

The Gurler silo, which is lined with cement, is giving excellent satisfaction, as it can be built in Illinois quite as cheap as the stave, and Mr. Gurler thinks that it will last for a much longer time. He has filled his silos six times and the cement shows no effect from wear. It is quite probable that in the near future an all cement structure will take the place of the cement lined and wooden silos.

Size to Build.

It should be borne in mind that a silo is nothing more nor less than a large air tight vessel, in which feed is "canned" for future use. The size of the silo depends upon the number of animals that are to be fed from it. In the main it should be tall and slim. It is difficult to build a silo too high, but it is easy to build it too large in diameter. The diameter should be of that size to allow at least a two inch layer of silage to be fed each day from the top surface. If the silage is exposed too long to the air it will spoil the same as canned fruit or vegetables. The average feed of silage is about forty pounds a day and the silo for winter feeding should hold enough to feed the stock for 200 days. The following table gives the dimensions the silo should be built for a given number of animals, and the number of days that it will feed them; it also gives the approximate capacity of each size and the average number of acres of corn it will take to fill the silo:

No. of Animals to be Fed from the Silo for 200 Days.	Inside Diameter.	Height.	No. Acres Corn.	Approximate Capacity in tons.
20 to 25.....	14	28	8 to 9	100
25 to 30.....	15	30	9 to 10	115
30 to 35.....	16	32	11 to 12	145
35 to 40.....	17	34	12 to 14	175
40 to 45.....	18	36	15 to 17	200
50 to 60.....	19	38	18 to 20	250
60 to 70.....	20	40	23 to 25	300

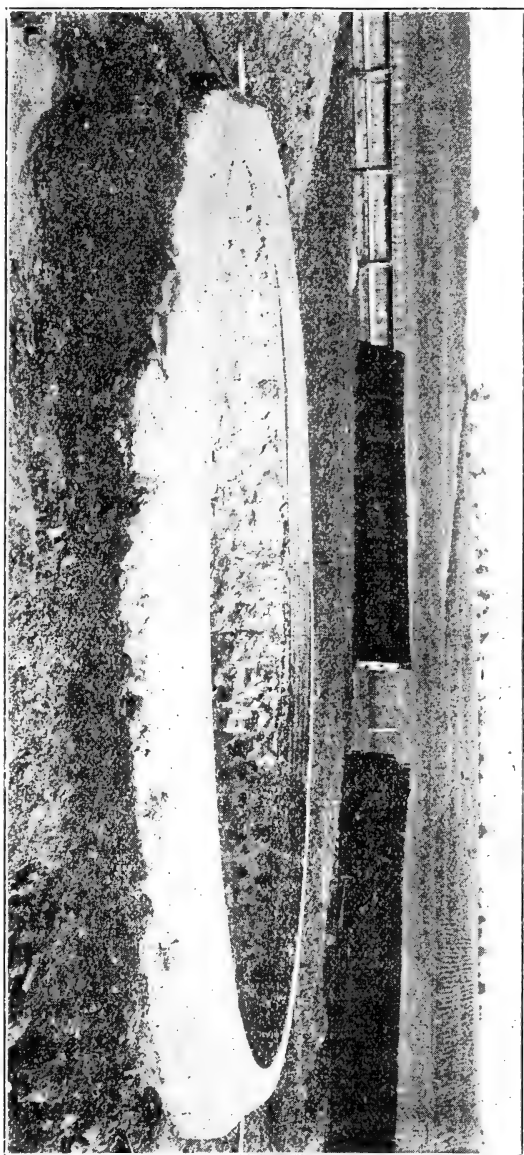
A silo should never be built over 20 feet in diameter. If it is necessary to have more material to feed it is better to build two smaller receptacles than one larger than 20 feet in diameter. It involves considerable more labor to handle silage in a very large structure than in one of reasonable size. Many farmers prefer to have two silos. They feed from one during the winter, and have the contents of the other for midsummer's feeding.

Location.

The silo should never be built in the barn. Silage is more or less a fermented product and must be fed with care, otherwise the milk may become tainted by its use. Barns that contain a silo always bear the odor of the silage and this should be avoided if high grade milk is to be produced. The building should be constructed outside of the barn, but close to it, and if possible at the end of the main feeding alley. The silo can be connected to the barn by means of a covered platform which is to receive the material when it is taken from the pit. A vehicle of some kind, which is used to carry the silage to the stock, can be wheeled on this platform and filled. The door between the platform and the barn should be closed when the contents are being taken from the silo.

Foundation.

A circular foundation of stone, brick or grout is constructed extending from two to three feet above the ground to protect the timbers from moisture. The wall is built from 14 to 20 inches thick, depending upon the nature of the soil and the size of silo to be built. The top of the wall should be beveled outward which permits the water to flow away very quickly from the base of the

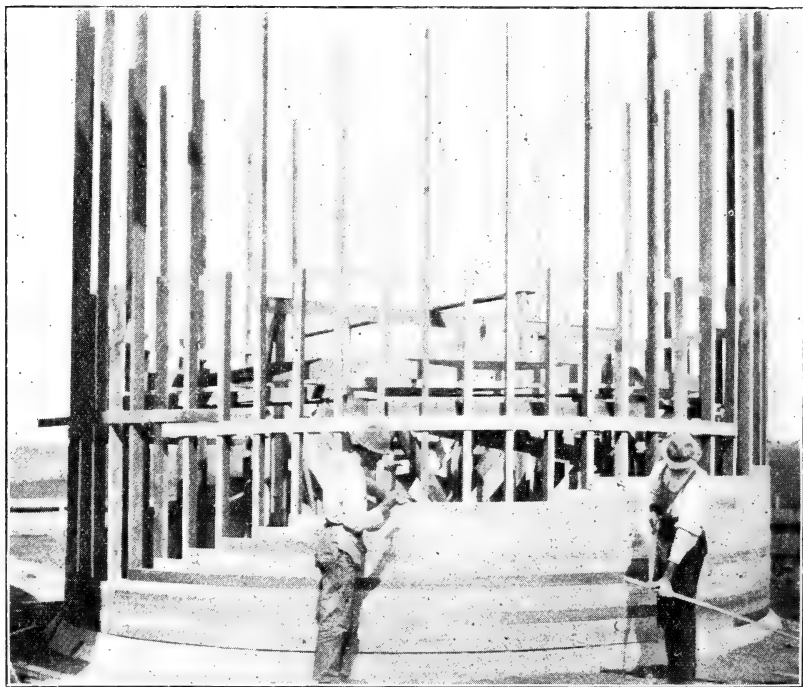


CUT 1—A circular foundation made of stone and concrete.

building. Since the attachment of the blower to the silage cutter it is not as essential to have the foundation extend into the ground six foot, for the blower can easily elevate the green corn fifty foot high. If a chain carrier is used it is best to have the silo extend into the ground five or six foot. The bottom of the silo does not need to be made water tight; the ground, as a rule, makes the best kind of a bottom, especially if it is well drained. In some cases it is well to drain the bottom of the pit with tiles. If rats and vermin become troublesome it is well then to cement the bottom.

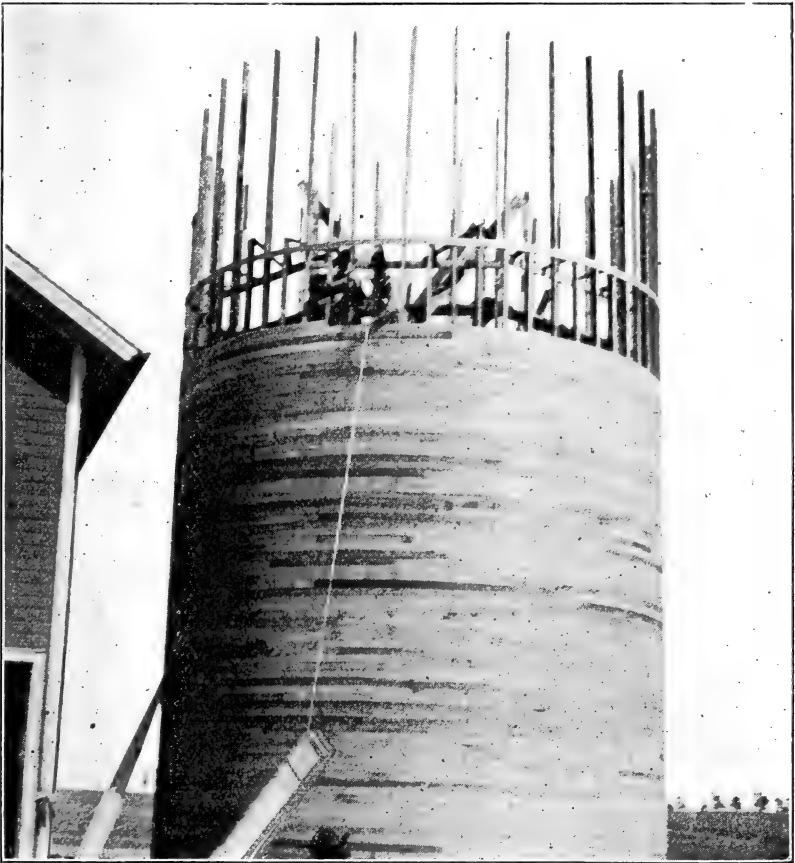
Construction of Gurler Silo.

The super-structure is made by setting 2x4 inch studding on the foundation, standing them from twelve to sixteen inches



Cut 2.

apart. The studding should be at least of two lengths, which will allow for the breaking of joints. While the 2x4's do not support any lateral pressure, but simply hold the material



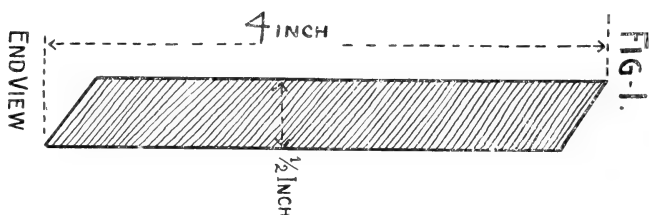
Cut 3.

Showing Silo at full height, 40 feet from bottom of pit to the the top of studdings, also men elevating sheeting.

together, it is quite necessary, nevertheless, that the splicing should not all come on the same plan. Cut 2 shows two lengths

of 2x4's and how the inside and outside sheetings are attached to them.

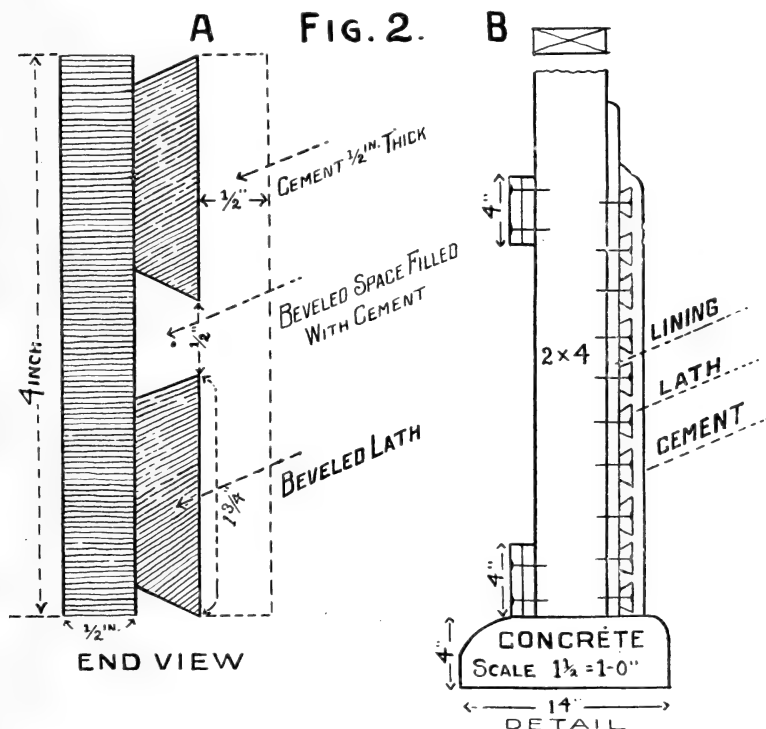
The next studdings are put on the ends of these and nailed to them. This process is continued until the desired height is reached. Inside and outside sheetings are half inch stuff made by resawing six inch fencing. Four inch boards can be used. The beveled siding, to protect the 2x4 inch studding and lining from the sun and rain, can be made from this $\frac{1}{2} \times 6$ inch material, as illustrated in Cut 4. It is not necessary to put paper between the sheeting and the 2x4's if siding of this kind is used, although some prefer to do so on account of the slight freezing of the



Cut 4.

ensilage in very cold winters. If paper is used some provision must be made for ventilation, which is of the highest importance to the preservation of the inside linings and studdings. Ventilation can be provided by boring holes in the bottom and top boards of the sheeting. Air must circulate between the studding or dry rot will soon destroy the 2x4's and inside sheeting.

The beveled lath is also made from the six inch fencing and is sawed with beveled edges so that when nailed horizontally to the inside sheeting a dovetailed opening is formed between the two lath. Cut 5 illustrates. The patent grooved lath can be used, but Mr. Gurler found difficulty in bending them to the circle. Common house lath is sometimes used and has always given good satisfaction. The beveled lath add a little more strength to the structure than common four foot lath. The silo needs no roof to protect the silage, but most all farmers

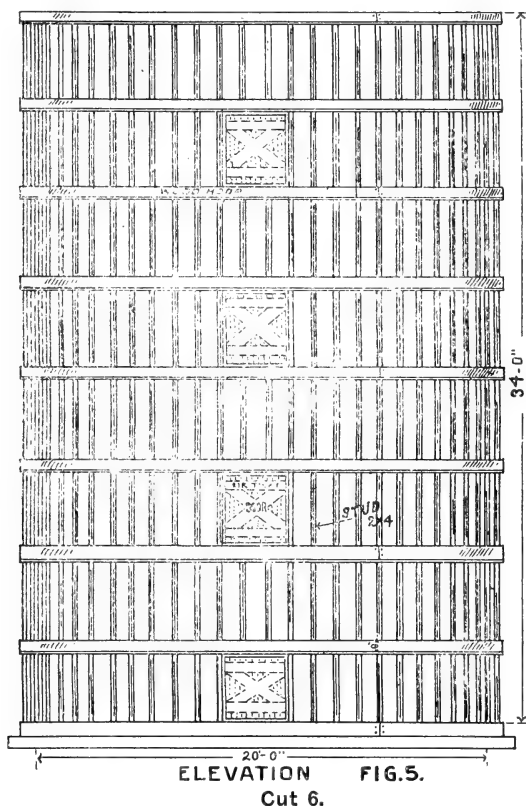


Cut 5.

prefer a covering to protect themselves from the snow and rain. A cheap roof can be made from 2x4 inch studding and plain boards, which will serve quite as well as the most expensive shingled roof. If the silo is placed in a shed it will need no covering, siding or painting. A few wooden hoops can be put on the building to strengthen it. The hoops are made from two thicknesses of the lining. Cut six illustrates the way the hoops are put on and the silo without siding or a roof.

Doors for the Silo.

The doors should not be over 6 feet apart. A silo 36 feet above the foundation should have at least five openings. A door

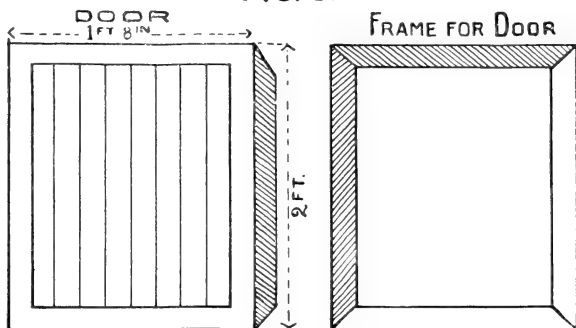


1 foot 8 inches by 2 feet is large enough. In making the frame for the door of the Gurler silo, two 2x4 inch studdings are sawed to the proper length and move sidwise to the desired width.

These pieces can be used for making the frame for the door. The frame is slightly larger on the inside than the door; and on the outside it is a little smaller. The door being slightly beveled on all four edges will wedge itself very tightly into a frame of this shape.

Cut 7 shows how the door is beveled and also the shape of the frame.

FIG. 3.



Cut 7.

The door can be made by doubling 2x6 inch plank and putting a layer of paper between them, or it can be made from several thicknesses of inch boards with paper between each two layers. It is very important that the opening through which the silage is thrown out, should be air tight when the receptacle is filled. A piece of tar paper can be put over the door when the silo is filling.

Cementing on Inside.

As soon as the shell of the silo is completed it is ready to be lined with the best Portland cement. Mix one part cement with two parts of real sharp clean sand. The cement should be about one-half inch thick over the lath. If the cement wall should crack enough to let the air pass through it, it can be re-cemented when the silo is being filled. Mr. Gurler, the inventor of this silo, has never had any trouble of this kind.

Cost of Building Gurler Silo.

The cost of building a Gurler silo depends somewhat on the location. If one is close to a saw mill and also has access to a good gravel pit a silo can be built considerably cheaper than when circumstances are such that all the material must be shipped by freight. A large silo will cost proportionally less

than a small one. Mr. Gurler built three silos, 20 feet in diameter and 36 feet high, in 1898, which cost him \$300.00 each. These silos had no roofs and they were not sided. H. J. Youngs, of Stillman Valley, built a Gurler silo, 18 feet in diameter and 36 feet high, in 1902, which cost him completed \$375.00. He did not use the beveled siding but put ruberoid between the sheeting and the studding. The one-half ply ruberoid cost him \$40.00.

A silo completed, that is sided and painted and having a plain roof made of boards, will cost from \$1.25 to \$2.00 per ton capacity to build.

What to Put in the Silo.

Indian corn is the most common crop that is used in filling the silo. It is cut into short lengths and on account of its solid and succulent stems it packs very closely, thereby excluding the air. The soy bean can be planted with the corn, and made into silage with it. This is important since the soy bean is so rich in protein. The mixing of one load of cow pea vines to two loads of green corn has given good results, in the southern states. Red clover has been used, but so far clover silage has been very unsatisfactory for it usually possesses a very offensive odor, and is not relished by the stock. The time may come when red clover can be used for silage, but there is much to learn about it before it can be recommended. If sorghum is allowed to mature, that is to develop a well filled seed head, it makes a very palatable silage. The general adaptability of sorghum, its drought resisting qualities and its large yields make it an admirable plant to grow for the silo.

Southern Versus Northern Seed Corn for Silage*

Digestion trials conducted during five years at the Maine Station by Jordon showed that sixty-five per cent of dry matter in the Southern corn silage was digestible, as against seventy-three per cent in the silage from corn of home-grown varieties. Digestion trials were also conducted at the Pennsylvania Station

* Henry's feeds and feeding

during three years by Armsby. In the following table are given the findings of Maine and Pennsylvania Station from direct trials.

Green weights, dry matter and digestible substance, per acre in corn forage from southern and northern-grown seed.

	Green Weights,	Dry Matter,	Digestible Substance,
	Lb.	Lb.	Lb.
Maine, seven trials, five years—			
Southern corn	34,761	5,036	3,251
Field corn	22,269	4,224	3,076
Pennsylvania, three years—			
Southern corn	32,321	7,993	5,042
Dent corn	18,606	6,177	4,149

This shows larger yields of green forage in every instance from Southern corn, which likewise, leads in dry matter and total digestible substance, although percentagely lower in digestibility as shown by Jordon.

When to Use Southern Corn for Silage.

From the table it appears that we are assured of larger returns of total dry and digestible matter at the North by the use of large Southern varieties of corn. Southern corn should not be grown for either silo or forage purposes, however, unless the climatic conditions permit the ears to develop grains of corn which reach the glazing stage at time of harvest. This variety of corn will prove a favorite for both silage and dry forage where there is an urgent demand for the largest possible amount of coarse, palatable forage from a given acreage. By the use of the Southern varieties of seed corn at the North the stockman can provide an enormous quantity of roughage from a given area.

On the other hand the stockman who has a fair supply of hay, straw or stover at command will fill his silo with a richer feeding stuff than that produced by Southern corn, and for this purpose will use varieties of flint or dent corn which will fully mature in his locality, planting the crop in such manner as to secure a relatively large proportion of grain to roughage. Silage made from the smaller varieties of corn, carrying a considerable pro-

portion of ears, will prove a rich feeding stuff which will materially reduce the necessity for additional grain. Corn silage, which is rich in carbohydrates, should be supplemented by clover hay, if possible, not only because some dry food is required, but because this hay is rich in protein.

How to Plant Corn.

Corn planted thickly in rows, and allowing only small ears of corn to develop will give a larger yield of fodder per acre, than corn planted in hills. When corn is planted this way it gives a more leafy crop and the stalks are not so large as when it is planted for grain alone. In wet seasons and especially on rich ground the corn planted in rows sometimes lodges thereby making it hard to cut. Gurler plants his corn for the silo in rows, and uses about 12 quarts of seed to the acre. Corn planted in hills is a very satisfactory way for silage, and if the land is weedy, it is perhaps best to plant the corn this way. This method gives a larger per cent of grain to stalks than corn that is planted thickly in rows.

When to Cut the Corn.

Corn for silo should be cut when the most advanced ears are well dented and the lower leaves of the corn stalks are beginning to dry. If it is cut much before this, the silage is apt to be of poor quality. It will develop too much acid and consequently be sour. There is more nutriment in corn if cut at the proper time, than if it is cut too early. If it should so happen that the corn is too ripe and somewhat too dry to make good silage a stream of water can be run into the silo when it is being filled. There is but little danger of running in too much water.

Size the Corn Should Be Cut.

The finer the green corn stalks are cut the closer they will pack in the silo. This is a strong argument in favor of cutting the corn very fine, for it is the germs in the air that spoils the

silage. It is true that good silage can be made from corn cut very coarse, but it is better to cut it into very small pieces. The claim is made by some dairymen that if the green stalks are cut too short, they will cause trouble by the short pieces getting between the cow's teeth. There are, however, many dairymen who cut their silage very fine, and they have never experienced any difficulty of this kind.

Machinery Needed.

The modern silage cutter with its blower attachment makes it an easy matter to fill the silo. There are a number of good makes of cutters on the market and they can be purchased at reasonable prices. The blower attached to the common corn shredder is not large nor strong enough to elevate the green corn stalks. If a blower is used it is quite necessary to buy a machine made for the elevation of green material. The engine to drive the modern silage cutter and blower should be at least 12 H. P. and a 16 H. P. is better. It is better to have a little too much power than not enough. With sufficient motive power, and plenty of help it is not hard to silo 50 tons of green corn a day. The common chain carrier does not require quite so much power to run it as cutter which has the blower attachment. If a chain carrier is used a single chain is better than the double one. When a link breaks in the single chain the whole carrier immediately stops while if one link should break in the double chain carrier a smash up usually follows before the machinery can be stopped. The pipe of the blower is raised and lowered very easily for the material is strong enough to support itself.

Cost of Filling.

King, of the Wisconsin Station, studied the operation of silo filling on four Wisconsin Dairy farms, and found the average amount of green fodder placed in the silo per man, daily, to be as follows:

Farm No. 1. 2.96 ton, per 10 hours labor.

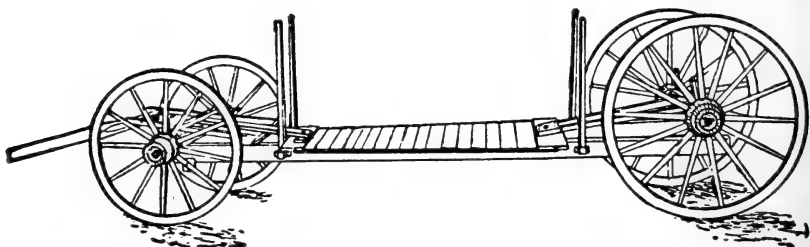
Farm No. 2. 2.60 ton, per 10 hours labor.
Farm No. 3. 2.45 ton, per 10 hours labor.
Farm No. 4. 2.43 ton, per 10 hours labor.
Station Farm, 1893. 2.37 tons, per 10 hours labor.

This shows that for each man working ten hours about two and one-half tons of green fodder were placed in the silo. Estimating labor at 15 cents per hour we have 58.6 cents as the cost of putting one ton of green corn in the silo.

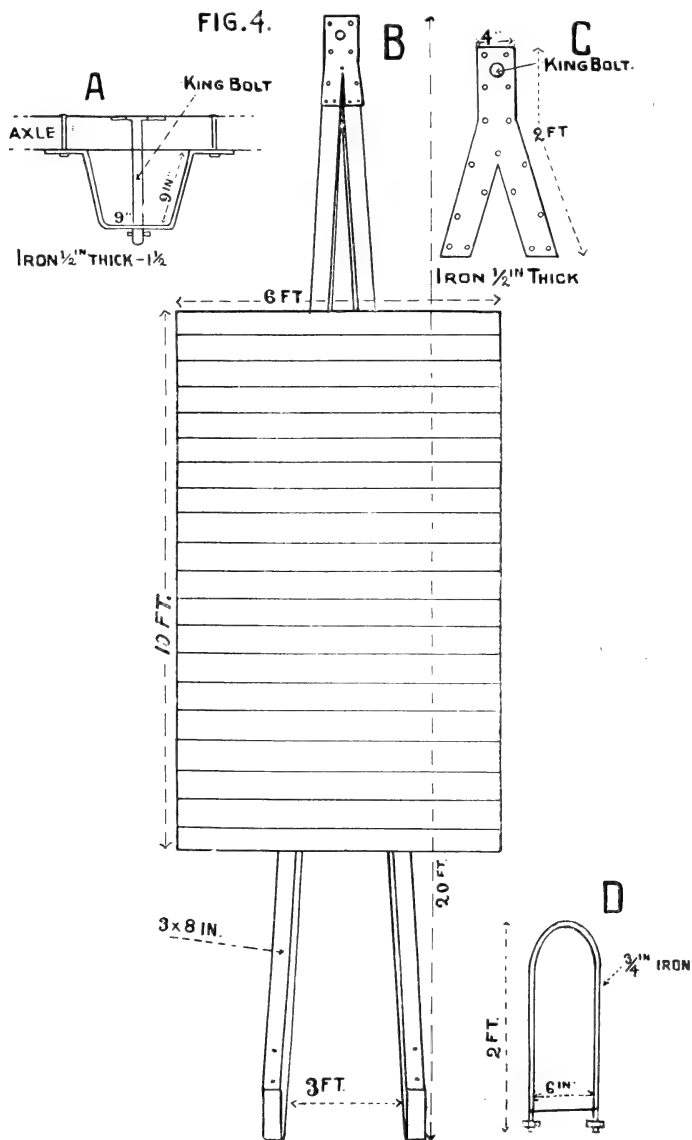
In my field work I found that the average amount of green fodder placed in the silo per man daily, as follows:

Farm No. 1. 3.57 tons, per 9 hours labor.
Farm No. 2. 7.34 tons, per 9 hours labor.
Farm No. 3. 5.20 tons, per 9 hours labor.
Farm No. 4. 4.28 tons, per 9 hours labor.
Farm No. 5. 5.41 tons, per 9 hours labor.

The average amount of green corn placed in the silo per man in 9 hours was 4.7 tons. This shows that modern machinery has greatly increased man's power, in the handling of green corn. It should be remembered that when King, of Wisconsin, obtained his results as to the amount of silage a man could put up in 10 hours, that we did not have the modern machinery for the filling of the silo. This undoubtedly accounts for the great difference in results of the two reports.



CUT 8—Shows low Platform Wagon.



Cut 9.

(A) Shows front axle and King bolt.

(B) Shows front end of platform which is attached to the under side of the front axle.

(C) Shows an iron which strengthens the splicing of the 3x8 in. timbers where they are attached to front axle.

(D) Shows an iron loop which goes over the hind axle and through the 3x8 in. timbers. This iron loop attaches platform to hind axle of the wagon.

It is well to take wagon to blacksmith shop to have this work done for not all wagons are the same size. These measurements apply to a particular wagon.

Amount of Help Needed and Rate of Filling.

For the average farm eight men can work to advantage, and they are used in the following places:

1 man with machine to cut the corn.

4 men and 4 teams to haul the corn to the cutter.

1 man to feed the machine.

1 man in the silo.

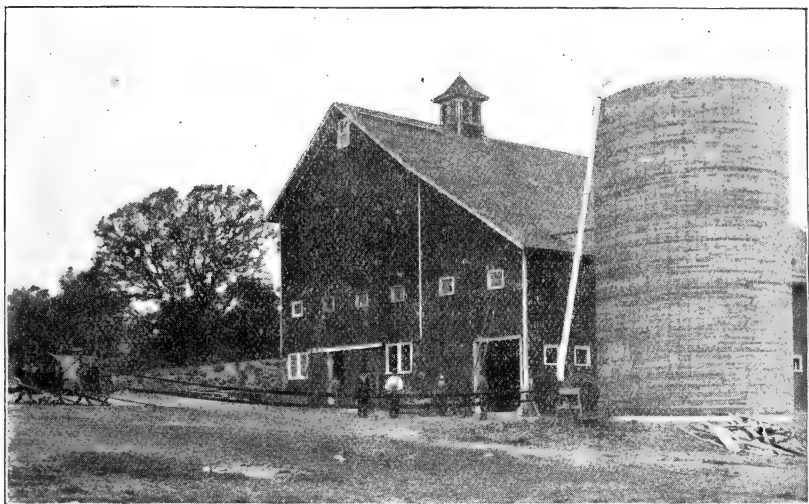
1 engineer.

Some farmer put one man in the field to help load, but this is not necessary if a low platform is attached to the wagon.

The man in the silo should keep the leaves, stalks and corn well mixed and he should tramp thoroughly every part of the surface, especially next to the wall. When the silo is full it is better to let the contents settle for a few days and then refill the second time. The silage should be tramped every day for a week after the work of filling the silo is done. Oats may be sown thickly on the top of the silage. They will sprout quickly on account of the heat and moisture, thereby forming a matted layer, which helps to preserve the contents of the pit. Four or five gallons of water put on every square foot of surface will hasten the fermentation of the material, which will soon compact itself into a more or less impervious layer.

Feeding the Silage.

Feeding from the silo may commence at once or it may be postponed indefinitely. Unless an ample amount of silage is put

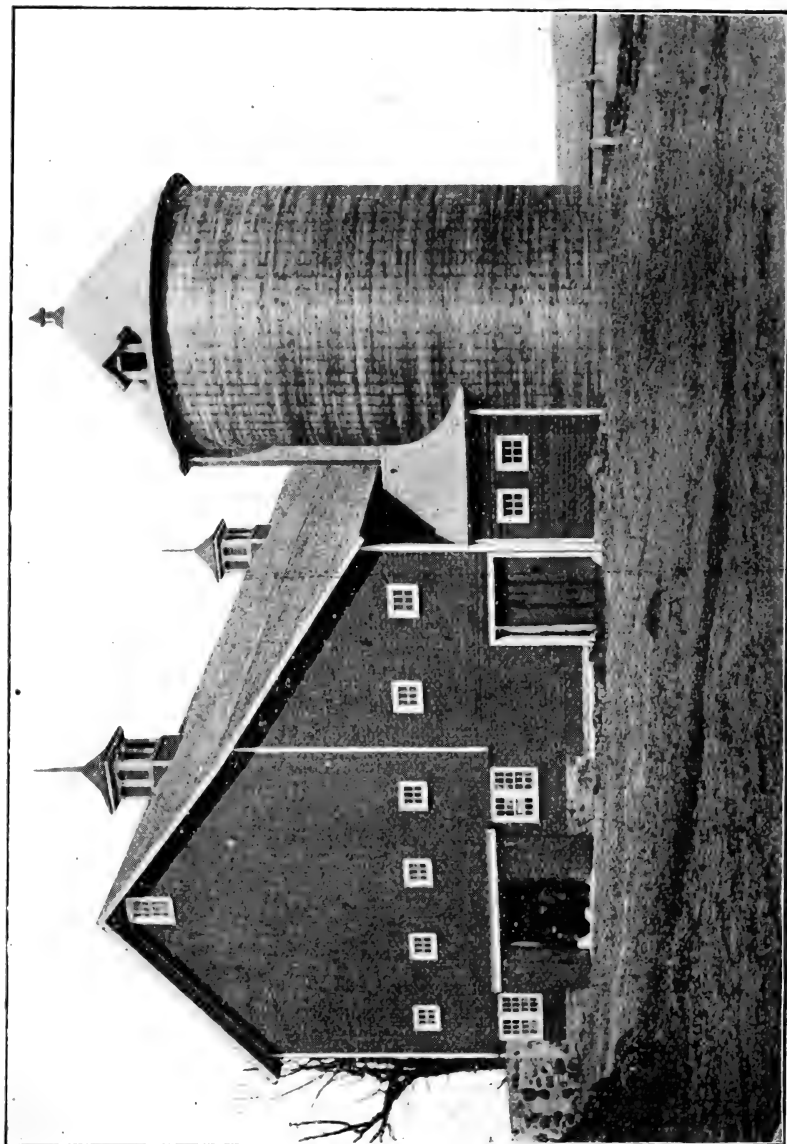


Cut 10.

Illustrates Position of Machinery ready to fill Silo.

up it is better to feed green corn directly from the field so long as it lasts, than to begin feeding immediately from the silo. The average dairymen feeds from 30 to 45 pounds of silage a day to each cow. This means that an acre of land yielding 12 tons of green corn will supply the average ration of silage for seven months to three animals. The amount of green corn raised per acre, ranges from 8 to 22 tons.

The silage should always be fed after milking on account of the odor that it imparts. If fed before it is apt to taint the milk or at least cause it to have an objectionable odor. It is also important that no silage is left lying around in the barn, or scattered in the feeding alleys. The mangers, alleys and every part of the barn should be entirely free from silage, as soon as the cows have finished eating that part of their ration. Years of experience and many careful experiments have shown that silage is one of the best milk producing foods that cows can be fed. If



CUT 11.—Shows Silo Completed.

the barn is properly ventilated and no silage is left strewn around on the floor to decay and to load the air with its odor, there will be no objections to the feeding of silage. It is the careless and indifferent dairymen who have led many people engaged in the milk business to condemn the silo.

The Advantages of the Silo.

There are still extravagant claims made for the silo. A few enthusiastic advocates claim that putting corn into a receptacle of this kind doubles its feeding value. There are no facts to prove assertions of this kind, for experiments from various stations have proven that the loss incurred by putting corn into the silo is nearly equal to the loss when it is put into shocks or racks, and moreover, the digestibility of fodder corn and silage are nearly the same, both being somewhat less digestible than green corn. Dairy cows as a rule have given better results when fed silage than when fed equal amounts of corn fodder. A considerable portion of the dry corn fodder is not consumed by the stock, but all the silage can be eaten.

On the other hand, the stock likes the silage better than the corn fodder and will consume more of it, thereby leaving more nutriment to form milk after the wants of the body have been supplied. The real merits of the silo can be summed up as follows:

- (1) Silage is more palatable the year through than dry corn fodder.
- (2) It is succulent which makes a satisfactory substitute for grass.
- (3) Stock will consume more silage than dry roughage.
- (4) It greatly increases the number of animals than can be kept on a given acreage.
- (5) The silo assures plenty of green feed during dry summers when there is a shortage of grass.
- (6) Silage keeps stock in good physical condition.

(7) It furnishes an abundance of prepared cheap and succulent roughage for all seasons of the year.

These are not all the advantages of the silo, but they are enough to suggest how very useful silage is to the American Agriculturist.

MAKING BUTTER ON THE FARM.

By A. J. Glover.

If proper methods are used there is no reason why the farmer should not manufacture as good butter upon the farm as can be made in the creamery. The improved machinery for home dairy work has greatly lessened the amount of labor connected with farm butter making and if the improved methods are used together with the modern machinery, home dairy work becomes comparatively easy.

Many people make this hard and tedious by not knowing how to do it properly. The simple fact of knowing at what temperature to churn the cream may save hours of time. How well many of us remember the day that the churning had to be done and we all have read of people heating a horse-shoe and putting it into the cream to drive the witches or bad spirits away. If this process were continued often enough the cream was warmed to the proper temperature and it churned more quickly. There were many other whims connected with home dairying, but they vanished as the dew of a summer morning when science made its appearance.

Care and Food for Cows

Good care and good food for dairy cows are two essential elements for the production of good dairy butter. We must

first have good milk and this comes from healthy cows. To keep the dairy in thrifty condition it must be fed on good sweet pasture, or on good grain, and wholesome forage, and given pure water. The feeding of rotten silage, mouldy corn fodder, or damaged grain, and allowing them to drink impure water will have their effect upon the health of the animal and the quality of milk. The cow when kept in the barn needs our special attention and care. It has been found by experiments that milk is more or less infected by germs (bacteria). A large number of those germs are found in the milk when it is drawn from the cow in the stable, even if the place where she is kept is clean and well ventilated.

Since bacteria are found nearly everywhere it almost seems a useless task to try to fight them, but we have already many ways in which we can destroy bacteria, and keep them from becoming injurious to our dairy products. The best way to keep free from injurious germs is to be clean. The cows should be provided with clean bedding. Many times cows are allowed to lie in filth; this makes an environment in which bacteria grow rapidly. In short the cow stable should be kept clean and well lighted and ventilated. The cows should also be kept clean by brushing them every day. The milk and butter utensils, that is, the milk pails, strainers, milk cans, churn, and butter-worker, should be kept clean and sweet.

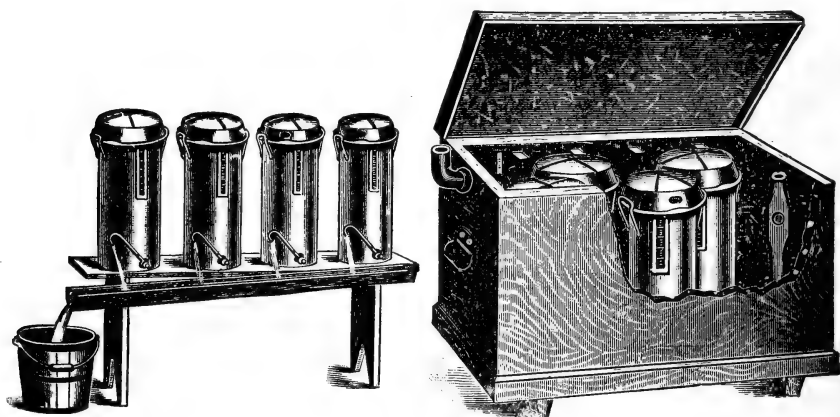
Clean Milk.

The cow's udders and sides should be brushed before milking begins to keep the dust and dirt from falling into the milk. The milking should be done with clean, dry hands, for it is an extremely filthy habit to milk with wet fingers. The milk should be strained immediately after milking, in a clean place, and through a wire gauze and three thicknesses of cheese cloth. All utensils in which milk is handled should be made of tin, wooden utensils should never be used. It is a good rule to follow, to clean all milk vessels immediately after using them. In washing the utensils rinse them first in cold or luke warm water, and then

wash them in hot water, using a good brush; then scald them in boiling water. Every dish or cloth that is used in connection with milk, after it is washed, should be put in a clean place and where there is circulation of pure air.

Methods of Creaming the Milk.

After the milk has been produced the next step is to separate the cream from it. The old way was to put the milk in shallow pans and set in the cellar or pantry for the cream to rise. By this method considerable butter fat was left in the skim milk, and at the end of the year, this loss amounted to considerable money, even though but few cows were kept.



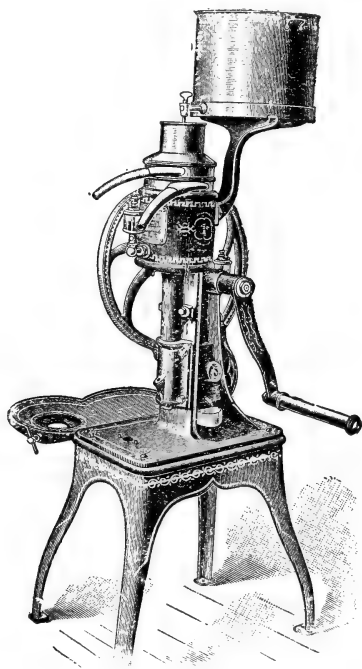
CUT 1. Illustrates a Cooley Creamer and Cans. The tank can be used for deep setting cans. It is not difficult to make a tank of this kind for holding the deep setting cans.

The next system that came in use was the cold deep setting. This method was to place the milk in a can 20 inches deep and 8 inches in diameter, and then put the can into a tank of ice water or cold well water. This method worked very well and separation was quite complete when the cans were kept in cold water from eighteen to twenty-four hours.



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CUT 2. Shows a Hand Separator.

The hand separator, which has become extensively used, was the next step in cream separation. The work of the separator is much more perfect than either of the other methods. This is shown by the increased amount of butter made when the hand separator is used. If great care is taken to keep the milk cool when set in shallow pans or deep cans fairly good separation will take place, but under ordinary conditions there will be a big loss in the skim milk as compared with the separator, which practically removes all the fat from the milk.

Room for Keeping the Milk.

No matter what method of creaming is used there should be some room in which to put the milk to be separated. This room should be kept neat and clean and white washed at least once a

year. When milk is set in cellars or pantries great care should be taken to have either room free from the smell of vegetables, or odors of any kind, as milk so quickly absorbs them. If the deep setting system is used, it is essential to put a tank in this room containing cold water. The cans of milk are put in this cold water which aids in the separation of cream. If possible ice should be put up and used to cool the water in the tank, during, at least, the hot days of summer. Where it is impossible to have ice try to arrange to have the wind mill pump water from the well directly into the tank and have the overflow pipe lead to the stock tank. When the milk is set in shallow pans it should be kept in a clean cool place. When the hand separator is used the milk should be separated immediately after milking and the cream cooled. By putting the can of cream into cold water and stirring it occasionally while the cream is being cooled it will keep sweet and produce butter having a better flavor.

Keeping Cream Sweet.

When cream is separated by a hand separator it is warm and should be cooled immediately to a temperature of 58 degrees or less and kept there until there is enough cream to churn. The cream from cold, deep setting should be also kept cold until enough has accumulated to make a churning. The quality of butter depends a great deal on keeping the cream cold and sweet. The cream can all be kept in one vessel provided the warm cream is cooled before mixing it with the cold cream. Just before churning all the cream is mixed together and ripened.

Ripening Cream.

This means mixing all the cream together at least twelve hours before churning, and souring it. Cream should be soured at a temperature of 65 or 70 degrees F. Every buttermaker should have a correct dairy thermometer, for one cannot do accurate work without it. It is necessary to know the temperature of the dairy room, the water, the cream when ripening and the temperature of the cream at the time of churning. No one can

guess every time the correct temperature, therefore, it is important to have a thermometer to not only save time, but to do good dairy work.



CUT 3—A Dairy Thermometer.

The cream that is separated by shallow pan system is usually ripe enough for churning before it is skimmed. It is necessary, however, to mix the different lots of cream together for a few hours before churning. Cream from cold, deep setting is usually cold and sweet and must be kept from 25 to 36 hours after it is skimmed to get it in the proper condition for churning. Separator cream is also kept for 24 to 36 hours after it is separated before it is ready to churn. All cream should be mixed together at least twelve hours before it is to be made into butter. It should also be stirred occasionally when it is being ripened.

How Often to Churn.

The best butter is made by churning every day, but upon most farms there is not enough cream to do this. If churning is done but twice a week good butter can be made if the cream has been kept cool and then ripened properly. Some farmers that own but two or three cows churn but once a week; under such conditions great care should be taken to keep the cream to 50 degrees F. if possible. When cream is kept at a high temperature for a long time, the butter will have an old flavor. This is one of the reasons why so much of the dairy butter is sold so cheap. If cream is kept much below a temperature of 50 degrees F. it is likely to develop a bitter flavor. This is especially true in cold weather.

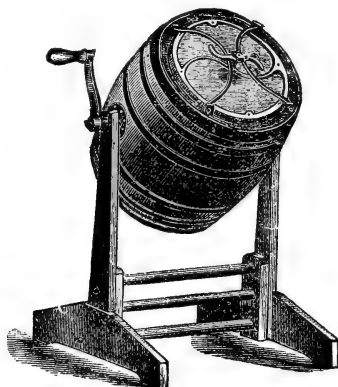
Preparing the Churn and the Butter Worker for Use.

The churn and the butter worker should be thoroughly scalded with boiling water and then cooled with cold well water

before the cream is put into the churn, or the butter put on the butter worker. A thorough scalding and cooling of the butter worker prevent the butter from sticking to it. It is very important to keep the churn and the butter worker out of the sun and well soaked with water, so they will not become checked or cracked.

Kind of Churn and Butter Worker to Buy.

The barrel churn, square box churn and rectangular churn all give good results. These churns "bring" the butter by con-



CUT 4—Shows a Barrel Churn.

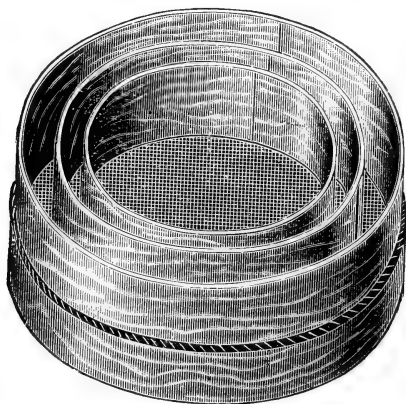
No. 0.	Five-gallon Churn;	churns	1 to 2	gallons of cream
No. 1.	Nine-gallon	"	1 to 4	"
No. 2.	Fifteen-gallon	"	2 to 7	"

cussion of the cream in falling from one side to the other as the churn is revolved. A five gallon churn will churn from one to two gallons of cream, and a nine gallon churn from one to four gallons. A lever butter worker is very cheap as well as a very efficient utensil. Size No. 0 will work twelve pounds of butter and size No. 1 will work twenty pounds of butter at a time.

Churning the Cream.

After the cream is ripened it is ready to churn. The first step is to cool the cream from 65 degrees F., the temperature at

which the cream was ripened, to about 55 degrees F. in the summer, and to 58 degrees F. in the winter. If at these temperatures the cream should come in ten minutes, and the butter is soft, the next churning should be cooled somewhat lower, say two degrees; on the other hand, if the cream is slow in coming the temperature should be raised. It should not take over 20 to 30 minutes to churn a batch of butter. The time that it takes to churn depends upon five things: (1) the ripeness of the cream. (2) The temperature of the cream. (3) The thickness of the cream or the per cent of the butter fat in it. (4) The length of time the cows have been milking. (5) The kind of feed that the cows are being fed. A gallon of cream should be heavy enough to churn three pounds of butter. When the cream is cooled to



CUT 5—Illustrates the different sizes of Horse Hair Sieves for straining buttermilk and cream. The 8-inch in diameter sieve is a very convenient size.

proper temperature it should be strained through a hair sieve into the churn. By doing this will remove the large chunks of curd from the cream and prevents the butter from having white specks. After straining the cream, butter color, if used, is put into the cream and then the cover to the churn is securely fixed. The churn should not be turned too rapidly, but at a speed that will produce the most concussion. A churn should never be filled

more than half full of cream. The churn should be stopped several times at the beginning of churning and cork removed to allow the escape of gases. When the cream begins to break considerable care should be exercised not to gather the butter granules into one large lump. Churning should cease when the butter particles are about the size of wheat kernels. The churn should be fastened and the butter milk drawn off. A fine hair sieve should be placed so the buttermilk can pass through it; this will catch any granules of butter that is likely to come out of the churn with the butter milk. When the butter is well drained from buttermilk, rinse it with a little water at a temperature of 55 degrees F. After this has drained away put the cork in the churn and add a half pailful of well water to every ten pounds of butter, put the cover on the churn and revolve it slowly at least six times; then draw off the water and let the butter drain for fifteen minutes.

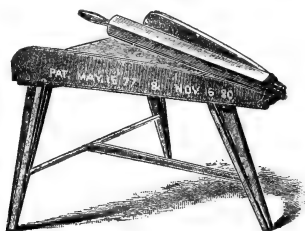
Coloring the Butter.

Butter should be colored to suit the people that are to buy it. Some persons want a high colored butter, while others prefer a very light color, and some require no coloring at all. When butter coloring is used it should be added to the cream after it is in the churn. A few drops of butter color should be added to the first churning and note the color of the butter. If the butter is too highly colored, less butter color should be used in the next churning; on the other hand, if the butter is too light use a little more butter color.

Salting the Butter.

When the butter is well drained it is ready to salt, and this is done in the churn, when the butter is in granular form. A part of the salt is sprinkled on top of the small granules and then the churn is turned enough to have the butter fall with unsalted side up and the rest of the salt is sifted on. Then put the cover on the churn and revolve it several times, after a few minutes the butter is taken out and worked. This method has its difficulties

for the exact amount of butter is not known, but it can be closely estimated. About one and a half ounces of salt is used for every one pound of butter, this will insure about the right amount of salt when the butter is finished. The butter should always be salted with good fine dairy salt, and coarse common barrel salt should never be used.



CUT 6—A Lever Butter Worker.

No. 0,	20	inches	wide;	will	work	12	pounds	of	butter
No. 1,	30	"	"	"	"	20	"	"	"
No. 2,	40	"	"	"	"	30	"	"	"

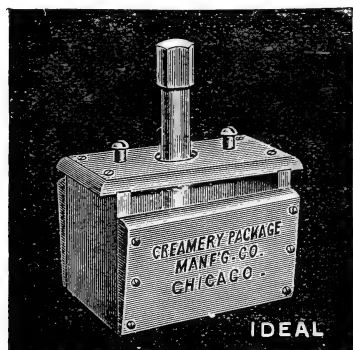
Working the Butter.

The butter should stand in the churn a few minutes so the salt will have a chance to dissolve; then it is taken out and put on the butter worker. The object of working butter is to press the granules together; to get the salt evenly distributed and to expel a portion of the brine. It is a very easy matter to work butter too much, and have the butter greasy. Butter should never be worked with the hands for the warm hands will make it have a greasy and salvy appearance. When the salt is evenly worked through the butter and it has an even color and the granules well pressed together it is time to quit working.

With the lever worker the butter is worked by pressing the lever on the surface of it, and occasionally folding the butter over with a laddle. Never allow the lever of the butter worker or butter paddle to slide over the surface of the butter, but press straight down when working the butter.

Package for Butter.

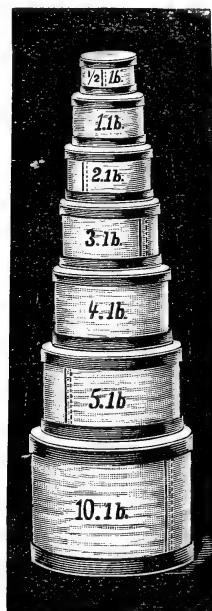
A neat attractive package is very important if high prices are to be received for dairy products. The butter may be put up in a



CUT 7—A Pound Butter Printer



CUT 8—Bradley Boxes.



CUT 9—The Gem Fibre Butter Package.

variety of packages. It can be pressed into square one pound prints and then wrapped with parchment papers, which should be soaked in salt water a few minutes before they are needed. Bradley boxes and the gem fibre package can be used, and they make a very neat and attractive package. The half gallon stone jar is also a nice package for delivering butter.

DAIRY LAWS OF ILLINOIS

Laws of 1879, page 111. (Hurd's Revised Statutes) (chapter 38, sections 9-9e).

AN ACT to regulate the sale of milk, and to provide penalties for the adulteration thereof. (Approved May 29, 1879).

Section 1. That whoever shall, for the purpose of sale for human food, adulterate milk with water or any foreign substance, or whoever shall knowingly sell for human food, milk from which cream has been taken, without the purchaser being informed or knowing the fact, or whoever shall knowingly sell for human food, milk from which what is commonly called "strippings" has been withheld, without the purchaser thereof being informed or knowing the fact, or whoever shall knowingly sell for human food milk drawn from a diseased cow, knowing her to be so diseased as to render her milk unwholesome, or whoever shall knowingly sell for human food, milk so tainted or corrupted as to be unwholesome, or whoever shall knowingly supply, or bring to be manufactured into any substance for human food, to any cheese or butter factory or creamery, without all interested therein knowing or being informed of the fact, milk which is adulterated with water or any foreign substance, or milk from which cream has been taken, or milk from which what is commonly called "strippings" has been withheld, or milk drawn from a diseased cow, knowing her to be so diseased as to injure her milk, or milk so tainted or corrupted as to be unwholesome, or whoever shall knowingly, with intent to defraud, take from milk after it has been delivered to a cheese factory or creamery, to be manufactured into any substance for human food, for or on account of the person supplying the milk or cream, or shall, with like intent, knowingly add any foreign substance to the milk or cream,

whereby it, or the products thereof, shall become unwholesome for human food, shall be guilty of a misdemeanor, and for each and every such misdemeanor shall be fined not less than twenty-five nor more than one hundred dollars or confined in the county jail not exceeding six months or both, in the discretion of the court.

Section 2. Any person who shall adulterate milk, with the view of offering the same for sale or exchange, or shall keep cows for the production of milk for market, or for sale or exchange, in an unhealthy condition, or knowingly feed the same on food that produces impure, diseased, or unwholesome milk, shall be deemed guilty of a misdemeanor, and, on conviction, shall be punished by a fine of not less than fifty dollars nor more than two hundred dollars, for each and every offense.

Section 3. Any person or persons who shall in any of the cities of this state, engage in or carry on a retail business in the sale, exchange of, or any retail traffic in milk, shall have each and every case in which the milk is carried or exposed for sale or exchange, and the carriage or vehicle from which the same is vended, conspicuously marked with his, her, or their name or names, also indicating by said mark the locality from which said milk is obtained or produced, and for every neglect for such markings, the person or persons so neglecting shall be subject to the penalties expressed in section 2 of this act; but for every violation of this act, by so marking said can, carriage, or vehicle, as to convey the idea that said milk is produced or procured from a different locality than it really is, the person or persons so offending shall be subject to a fine of one hundred dollars.

Section 4. Any person who shall, in any of the cities in this state, offer for sale any milk from which the cream or any part thereof shall have been taken, shall offer for sale and sell the same as skimmed milk, and not otherwise, and shall have each can or vessel in which such milk is carried or exposed for sale, plainly and conspicuously marked with the words "Skimmed

Milk." Any person violating this section shall be subject to a fine not exceeding fifty dollars for each and every violation.

Section 5. Upon the rendition of judgment imposing a fine as provided in the foregoing sections, it shall be the duty of the justice of the peace or other court rendering said judgment, also to render a judgment for the costs, and forthwith to issue a capias or warrant of commitment against the body of the defendant commanding that, unless the said fine and costs be forthwith paid, the defendant shall be committed to the jail of the county, and the constable or other officer to whose hand said capias or warrant shall come shall, in default of such payment, arrest the defendant and commit him to the jail of the county, there to remain, as provided by section 308 of "An act to revise the law in relation to criminal jurisprudence," in force July 1, 1874, unless such fine and costs shall sooner be paid.

Section 6. The addition of water or any foreign substance to milk or cream intended for sale or exchange is hereby declared an adulteration. Any milk that is obtained from cows fed on distillery waste, usually called "swills," or upon any substance in a state of putrification, is hereby declared to be impure and unwholesome. Nothing in this act shall be construed to prevent the addition of sugar in the manufacture of condensed or preserved milk.

Section 7. Section nine of division one of an act entitled "An act to revise the law in relation to criminal jurisprudence (approved March 27, 1874); and all other acts and parts of acts inconsistent herewith are hereby repealed.

Laws of 1883, page 54 (Revised Statutes, chapter 5, section 29-32).

AN ACT to require operators of butter and cheese factories on the co-operative plan to give bonds, and to prescribe penalties for the violation thereof. (Approved June 18, 1883).

Section 1. That it shall be unlawful for any person or persons, company or corporation, within this state to operate, carry

on, or conduct the business of manufacturing butter or cheese on the co-operative or dividend plan until such person or persons, company or corporation, shall have filed with the circuit clerk or recorder of deeds of the county in which it is proposed to carry on such business, a good and sufficient bond, to be approved by such circuit clerk or recorder of deeds, in the penal sum of six hundred dollars, with one or more good sureties, conditioned that such person or persons, company or corporation proposing to carry on such business will, on or before the first day of each month, make, acknowledge, subscribe, and swear to a report in writing, showing the amount of product manufactured, the amount sold, the prices received therefor, and the dividends earned and declared for the third month preceding the month in which such report is made, and will file a copy of such report with the clerk of the town or precinct in which such factory is located, and will also keep publicly posted, in a conspicuous place in such factory, a copy of such report for the inspection of the patrons thereof, and that such dividends shall be promptly paid to the persons entitled thereto.

Section 2. Such bond shall run to the people of the State of Illinois, and shall be for the benefit and protection of all patrons of such factory, and suit may be had thereon by any person or persons injured by a breach of the conditions thereof by any action of debt for the use of the person or persons interested for all damages sustained by them.

Section 3. Such bond shall be recorded by the circuit clerk or recorded with whom the same is filed, and all such reports so filed with any town or precinct clerk shall be preserved by him and held subject to the inspection of any person or persons interested.

Section 4. Any person who shall willfully violate any provision of this act shall be liable to a fine of not less than two hundred dollars, or more than five hundred dollars, or imprison-

ment in the county jail for not less than thirty days nor more than six months, or both, in the discretion of the court.

Laws of 1879, page 11 (Revised Statutes, chapter 38, sections 39a-39c).

AN ACT to prevent frauds in the manufacture and sale of butter and cheese. (Approved May 31, 1879).

Section 1. That whoever manufactures, sells, or offers for sale, or causes the same to be done, any substance purporting to be butter or cheese, or having the semblance of butter or cheese, which substance is not made wholly from pure cream or pure milk, unless the same be manufactured under its true and appropriate name, and unless each package, roll, or parcel of such substance, and each vessel containing one or more packages of such substance, have distinctly and durably painted, stamped, or marked therein the true and appropriate name of such substance, in ordinary boldfaced capital letters not less than five lines pica, shall be punished as provided in section 3 of this act.

Section 2. Whoever shall sell any such substance as is mentioned in section 1 of this act to consumers, or cause the same to be done, without delivering with each package, roll, or parcel so sold, a label on which is plainly and legibly printed, in Roman letters, the true and appropriate name of such substance, shall be punished as is provided in section 3 of this act.

Section 3. Whoever knowingly violates section 1 or section 2 of this act shall be fined in any sum not less than ten nor more than three hundred dollars, or imprisoned in the county jail not less than ten nor more than ninety days, or both in the discretion of the court; Provided, That nothing contained in this act shall be construed to prevent the use of skimmed milk, salt, rennet, or harmless coloring matter, in the manufacture of butter and cheese.

Laws of 1881, page 74, (Revised Statutes, chapter 38, sections 9f-9g).

AN ACT to prevent the adulteration of butter and cheese, or the sale or disposal of the same, or the manufacture or sale of any article as a substitute for butter or cheese, or any article to be used as butter and cheese. (Approved June 1, 1881).

Section 1. That whoever manufacturers, out of any oleo-ginous substances, or any compound of the same other than that produced from unadulterated milk, or cream from the same, any article designed to take the place of butter or cheese produced from pure, unadulterated milk, or cream of the same, and shall sell, or offer for sale, the same as butter or cheese, or give to any person the same as an article of food, as butter or cheese, shall, on conviction thereof, be fined not less than twenty-five dollars nor more than two hundred dollars.

Section 2. All acts or parts of acts inconsistent with this act are hereby repealed.

Laws of 1881, page 75 (Revised Statutes, chapter 38, sections 9h-9o).

AN ACT to prevent and punish the adulteration of articles of food, drink and medicine, and the sale thereof when adulterated. (Approved June 1, 1881).

Section 1. That no person shall mix, color, stain, or powder, or order or permit any person in his or her employ to mix, color, stain or powder any article of food with any ingredient or material, so as to render the article injurious to health, or depreciate the value thereof, with intent that the same may be sold; and no person shall sell or offer for sale any such article so mixed, colored, stained or powdered.

* * * *

Section 3. No person shall mix, color, stain, or powder any article of food, drink, or medicine, or any article which enters

into the composition of food, drink, or medicine, with any other ingredient or material, whether injurious to health or not, for the purpose of gain or profit, or sell, or offer the same for sale, or permit any person to sell or offer for sale any article so mixed, colored, stained, or powdered, unless the same be so manufactured, used, or sold, or offered for sale under its true and appropriate name, and notice that the same is mixed or impure is marked, printed, or stamped upon each package, roll, parcel or vessel, containing the same, so as to be and remain at all times readily visible, or unless the person purchasing the same is fully informed by the seller of the true name and ingredients (if other than such as are known by the common name thereof) of such article of food, drink or medicine, at the time of making sale thereof, or offering to sell the same.

Section 4. No person shall mix oleomargarine, suine, butterine, beef fat, lard, or any other foreign substance, with any butter or cheese intended for human food, without distinctly marking, stamping, or labeling the article, or the package containing the same, with the true and appropriate name of such article, and percentage in which such oleomargarine or suine enters into its composition; nor shall any person sell or offer for sale, or order or permit to be sold or offered for sale, any such article of food into the composition of which oleomargarine or suine has entered, without at the same time informing the buyer of the fact, and the proportions in which such oleomargarine, suine, or butterine, beef fat, lard, or any other foreign substance has entered into its composition. Provided, That nothing in this act shall be so construed as to prevent the use of harmless coloring matter in butter or cheese, or other articles of food.

Section 5. Any person convicted of violating any provisions of any of the foregoing sections of this act shall, for the first offense, be fined not less than twenty-five dollars nor more than two hundred; for the second offense he shall be fined not less than one hundred nor more than two hundred dollars, or confined in the county jail not less than one month nor more

than six months, or both, at the discretion of the court; and for the third and all subsequent offenses he shall be fined not less than five hundred dollars nor more than two thousand dollars, and imprisoned in the penitentiary not less than one year nor more than five years.

Section 6, which makes ignorance of the provisions of the law a defense against prosecution, is repealed in the food commission bill.

Section 7. The State's Attorneys of this state are charged with the enforcement of this act, and it is hereby made their duty to appear for the people, and to attend to the prosecution of all complaints under this act, in their respective counties, in all courts.

Section 8. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

Laws of 1897, page 3 (Revised Statutes, chapter 38, sections 39d-39n).

AN ACT to regulate the manufacture and sale of substitutes for butter. (Approved June 14, 1897).

Section 1. That for the purpose of this act every article, substitute, or compound other than that which is produced from pure milk or cream therefrom, made in the semblance of butter and designed to be used as a substitute for butter made from pure milk or its cream, is hereby declared to be imitation butter. Provided, That the use of salt and harmless coloring matter for coloring the product of pure milk or cream shall not be construed to render such product an imitation.

Section 2. No person shall coat, powder, or color with annatto or any coloring matter whatever any substance designed as a substitute for butter, whereby such substitute or product so colored or compounded shall be made to resemble butter, the product of the dairy. No person shall combine any animal fat

or vegetable oil or other substance with butter or combined therewith or with animal fat or vegetable oil or combination of the two, or with either one, any other substance or substances, for the purpose or with the effect of imparting thereto a yellow color or any shade of yellow so that such substance shall resemble yellow or any shade of genuine yellow butter, nor introduce any such coloring matter or such substance or substances into any of the articles of which the same is composed; Provided, Nothing in this act shall be construed to prohibit the use of salt, rennet, and harmless coloring matter for coloring the products of pure milk or cream from the same.

No person shall, by himself, his agents, or employes, produce or manufacture any substance in imitation or semblance of natural butter, nor sell, nor keep for sale, nor offer for sale any imitation butter, made or manufactured, compounded or produced in violation of this section, whether such butter shall be made or produced in this state or elsewhere. This section shall not be construed to prohibit the manufacture and sale, under the regulations hereinafter provided, of substances designed to be used as a substitute for butter and not manufactured or colored as herein prohibited.

Section 3. Every person who lawfully manufacture any substance designed to be used as a substitute for butter shall mark by branding, stamping, or stenciling upon the top and sides of each tub, firkin, box, or other package in which said article shall be kept and in which it shall be removed from the place where it is produced, in a clean and durable manner, in the English language, the word "Oleomargarine," or the word "Butterine," or the words "Substitute for Butter," or the words "Imitation Butter," in printed letters in plain, Roman type, each of which shall not be less than three-quarters of an inch in length.

Sec. 4. It shall be unlawful to sell or offer for sale any imitation butter without informing the purchaser thereof, or the

person or persons to whom the same is offered for sale, that substance sold or offered for sale is imitation butter.

Sec. 5. No person, by himself for another, shall ship, consign, or forward by any common carrier, whether public or private, any substance designed to be used as a substitute for butter, unless it shall be marked or branded on each tub, box, firkin, or other package containing the same, as provided in this act, and unless it be consigned by the carrier and receipted for by its true name: Provided, That this act shall not apply to any goods in transit between foreign States across the State of Illinois.

Sec. 6. No person shall have in his possession, or under his control, any substance designed to be used as a substitute for butter, unless the tub, firkin, jar, box, or other package containing the same be clearly and durably marked, as provided in this act: Provided, That this section shall not be deemed to apply to persons who have the same in their possession for the actual consumption for themselves or their families. Every person who shall have in his possession or control any imitation butter for the purpose of selling the same, which is not marked as required by the provisions of this act, shall be presumed to have known during the time of such possession or control the true character and name as fixed by this act of such product.

Sec. 7. Whoever shall have possession or control of any imitation butter or any substance designed to be used as a substitute for butter, contrary to the provisions of this act, for the purpose of selling the same, or offering the same for sale, shall be held to have possession of such property with intent to use it in violation of this act.

Sec. 8. No action shall be maintained on account of any sale or contract made in violation of or with the intent to violate this act by or through any person who was knowingly a party to such wrongful sale or contract.

Sec. 9. Whoever shall deface, erase, or remove any mark

provided by this act, with intent to mislead, deceive, or to violate any of the provisions of this act, shall be guilty of a misdemeanor.

Sec. 10. Whoever shall violate any of the provisions of this act shall be punished by a fine of not less than fifty nor more than two hundred dollars, or by imprisonment in the county jail not to exceed sixty days, for each offense, or by both fine and imprisonment, in the discretion of the court, or the fine alone may be sued for and recovered before any justice of the peace in the county where the offense shall be committed, at the instance of any person, in the name of the people of the State of Illinois as plaintiff.

Sec. 11. It is hereby made the duty of the State's attorney of each county in this State to prosecute all violations of this act upon complaint of any person, and there shall be taxed as his fees in the case the sum of ten dollars, which shall be taxed as costs in the case.

AN ACT to protect the public from imposition in relation to canned or preserved food. (Approved June 27, 1885.)

Section 1. That it shall hereafter be unlawful in this State for any packer or dealer in preserved or canned fruits and vegetables or other articles of food to offer such canned articles for sale after January 1, 1886, with the exception of goods brought from foreign countries, or packed prior to the passage of this act, unless such articles bear a mark to indicate the grade or quality, together with the name and address of such firm, person, or corporation that packed the same or dealer who sells the same. The firm, person, or corporation labeling such goods shall be considered the packer or packers.

Sec. 3. Any person, firm, or corporation, who shall falsely stamp or label such cans or jars containing preserved fruit or food of any kind, or knowingly permit such false stamping or labeling, and any person, firm, or corporation who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor

and punished with a fine of not less than fifty dollars; in the case of vendors, and in the case of manufacturers and those falsely or fraudulently stamping or labeling such cans or jars, a fine of not less than five hundred dollars not more than one thousand dollars, and it shall be the duty of any board of health in this State cognizant of any violation of this act to prosecute any person, firm, or corporation which it has reason to believe has violated any of the provisions of this act, and after deducting the costs of the trial and conviction, to retain for the use of such board the balance of the fine or fines recovered.

PURE FOOD COMMISSIONER'S BILL

For an act to provide for the appointment of a State Food Commissioner and to define his powers and duties and fix his compensation, and to prohibit and prevent adulteration, fraud and deception, in the manufacture and sale of articles of food, and to repeal certain acts or parts of acts therein named.

Section 1. Be it enacted by the People of the State of Illinois represented in the General Assembly: That the office of State food commissioner for the State of Illinois is hereby created. Within thirty days after this act shall take effect such commissioner shall be appointed by the Governor, by and with the advice and consent of the Senate, and his term of office shall be for two (2) years from the date of his appointment and until his successor is appointed and qualified. Thereafter the term of office of the commissioner shall be for four years and until his successor is qualified. The salary of the commissioner shall be twenty-five hundred dollars (\$2,500) per annum and his necessary and actual expenses incurred in the discharge of his official duties.

2. Such commissioner may, with the advice and consent of the Governor, appoint two assistant commissioners, each of acknowledged standing, ability, and integrity, one of whom shall be an expert in the matter of dairy products, and the other of whom shall be a practical and analytical chemist, who shall be known as State analyst. The salaries of such assistants shall not exceed eighteen hundred dollars (\$1,800) each per annum and their necessary and actual expenses incurred in the discharge of their official duties. In case of the absence or inability of the State analyst to perform all the duties of his office, the commissioner may appoint some competent person to assist in the same temporarily.

3. The food commissioner shall have authority to appoint necessary inspectors not exceeding six in number to assist in the work of the food commissioner at such times and for such periods of time as may be required in the enforcement of the dairy food laws of the State. Such inspectors shall have the same right of access to places to be inspected as the commissioner. The compensation of such inspectors shall be three dollars (\$3.00) per day for each day of actual service, and their necessary and actual expenses when so employed.

4. It shall be the duty of the commissioner to enforce all laws that now exist or that may hereafter be enacted in this State regarding the production, manufacture, or sale of dairy products, or the adulteration of any article of food, and personally or by his assistants to inspect any article of food made or offered for sale within this State, which he may, through himself, or his assistants, suspect or have reason to believe to be impure, unhealthy, adulterated or counterfeit, and to prosecute, or cause to be prosecuted, and person or persons, firm or firms, corporation or corporations, engaged in the manufacture or sale of any adulterated or counterfeit article or articles of food contrary to the laws of this state.

5. It shall be the duty of the food commissioner to carefully inquire into the quality of the dairy and food products, and the

several articles which are foods or the necessary constituents of food, which are manufactured for sale or sold or exposed or offered for sale in this State, and he may in a lawful manner procure samples of the same, and direct the State analyst to make due and careful examination of the same, and report to the commissioner the result of the analysis of all or any such food or dairy products as are adulterated, impure or unwholesome, in contravention of the laws of this State, and it shall be the duty of the commissioner to make complaint against the manufacturer or vender thereof in the proper county, and furnish the prosecuting attorney with the evidence thereon and thereof to obtain a conviction for the offense charged. The food commissioner, or his assistants, or any person by him duly appointed for that purpose, shall have power in the performance of their duties to enter any dairy, creamery, cheese factory, store, salesroom, warehouse (excepted bounded warehouses for the storage of distilled spirits), where goods are stored or exposed for sale, or place where they have reason to believe food is stored or offered for sale, and to open any cask, tub, jar, bottle or package containing or supposed to contain any article of food, and examine or cause to be examined the contents thereof, and take therefrom samples for analysis. The person making such inspection shall take such samples of such articles of produce, in the presence of at least one witness, and he shall, in the presence of such witness, mark or seal such sample and shall tender, at the time of taking, to the manufacturer or vender of such produce, or to the person having the custody of the same, the value thereof, but if the person from whom such sample is taken shall request him to do so, he shall, at the same time and in the presence of the person from whom such property is taken, securely seal up two samples of the article seized or taken, the one of which shall be for examination or analysis under the direction of the commissioner, and the other of which shall be delivered to the person from whom the article was taken. Any person who shall obstruct the commissioner or any of his assistants by refusing to allow him entrance to any place which he desires to enter in the discharge of his official duty, or

refuse to deliver to him a sample of any article of food made, sold or exposed for sale by such person, when the same is requested, and when the value thereof is tendered, shall be guilty of a misdemeanor, punishable by a fine of not exceeding fifty dollars (\$50.00) for the first offense, and not exceeding five hundred dollars (\$500) or less than fifty dollars (\$50.00) for each subsequent offense.

6. It shall be the duty of the State's attorney in any county of the State, when called upon by the commissioner or any of his assistants, to render any legal assistance in his power to execute the laws and to prosecute cases arising under the provisions of this act.

7. The State board of health may submit to the commissioner, or to any of his assistants, samples of food or drink for examination or analysis, and shall receive special reports, showing the results of such examination or analysis.

8. It shall be unlawful for the State analyst, while he holds his office, to furnish to any individual, firm or corporation any certificate as to the purity or excellence of any article manufactured or sold by them to be used as food or in the preparation of food.

9. The salary of the commissioner shall be paid from the fund appropriated for the payment of the salaries of State officers, and his assistants shall be paid out of the State treasury from the same fund and in the same manner as the salaries of other employes of the State are paid, and their official expenses shall be paid at the end of each calendar month upon bills duly itemized and approved by the Governor, and the amount necessary to pay such salaries and expenses is hereby appropriated.

10. The commissioner may, under the direction of the Governor, fit up a laboratory, with sufficient apparatus for making analysis contemplated in this act, and for such purpose the sum of fifteen hundred dollars (\$1,500), or so much thereof as may be

necessary, is hereby appropriated; and for the purpose of providing materials, and for necessary expenses connected with the making of such analysis, there is also hereby appropriated so much as may be necessary, not exceeding six hundred dollars (\$600) annually. The appropriation provided for in this section shall be drawn from the State treasury upon certified bills approved by the Governor.

11. The commissioner shall make an annual report to the Governor on or before the first day of January in each year, which shall be printed and published. Such report shall cover the doings of his office for the preceding year and shall show, among other things, the number of factories, creameries and other places inspected, and by whom; the number of specimens of food articles analyzed, and the State analyst's report upon each one when the analysis indicates the same to be contrary to law; the number of complaints entered against persons for violation of the laws relative to the adulteration of food; the number of convictions had and the amount of fines imposed therefor, together with such recommendations relative to the statutes in force as his experience may justify. The commissioner may also prepare, print and distribute to the newspapers of the State, and to such persons as may be interested or may apply therefor, a monthly bulletin containing results of inspections, the results of analysis made by the State analyst of articles offered for sale contrary to law, with popular explanation of the same, and such other information as may come to him in his official capacity relating to the adulteration of food and drink products and of dairy products, so far as he may deem the same of benefit and advantage to the public; also a brief summary of all the work done during the month by the commissioner and his assistants in the enforcement of the laws of the State, but not more than ten thousand copies of each of such monthly bulletins shall be printed: Provided the necessary printing shall be done by the State printer, and all expenses for stationery and printing shall be audited and paid from the same fund and in the same manner as other State printing and stationery.

All fines, penalties and costs recovered for violations of this act and other acts now enacted or hereafter to be enacted prohibiting or regulating the adulteration of foods shall be paid into the state treasury to the credit of the general fund of the state.

12. No person shall, within this state, manufacture for sale, have in his possession with intent to sell, offer for sale, or sell any article of food which is adulterated within the meaning of this act.

13. The term "food," as used herein, shall include all articles whether simple, mixed or compound, used for food, candy, drink or condiment by man or domestic animals.

14. An article shall be deemed to be adulterated within the meaning of this act:

First—If any substance or substances has or have been mixed with it so as to depreciate, lower or injuriously affect its quality, strength or purity.

Second—If any inferior or cheaper substance or substances has or have been substituted wholly or in part for the article.

Third—If any valuable necessary constituent or ingredient has been wholly or in part abstracted from it.

Fourth—If it be an imitation of and sold under the name of another article.

Fifth—If it is mixed, colored, coated, polished or powdered, whereby damage or inferiority is concealed, or if by any means it is made to appear better or of greater value than it really is.

Sixth—If it contains wholly or in part of a decomposed, putrid, infected, tainted or rotten animal or vegetable substance or article, whether manufactured or not, or, if it is the produce of a diseased animal, or if of an animal that has died otherwise than by slaughter. Provided, that an article of food that does not contain any ingredient injurious to health, and in the case of mixtures or compounds, which may be now, or from time to

time hereafter, known as articles of food under their own distinctive names, or which shall be labeled so as to plainly indicate that they are mixtures, combinations, compounds or blends, and not included in definition fourth of this section, shall not be deemed to have been adulterated. Provided, further, that all manufactured articles of food offered for sale shall be distinctly labeled, marked or branded with the name of the manufacturer and place of manufacture, or the name and address of the packer or dealer who sells the same.

15. No person shall manufacture for sale, offer or expose for sale, sell or deliver, or have in his possession with intent to sell or deliver, any vinegar not in compliance with the provisions of this act. No vinegar shall be sold as apple, orchard or cider vinegar which is not the product of pure apple juice, known as apple cider and apple orchard or cider vinegar upon test shall contain not less than one and three-fourths per cent, by weight, of cider vinegar solids upon full evaporation at the temperature of boiling water.

16. All vinegar made by fermentation and oxidation without the intervention of distillation shall be branded with the name of the fruit or substance from which the same is made. All vinegar made wholly or in part from distilled liquor shall be branded "distilled vinegar." All fermented vinegar, not distilled, shall contain not less than one and one-fourth per cent, by weight, upon full evaporation (at the temperature of boiling water), of solids contained in the fruit from which said vinegar is fermented, and said vinegar shall contain not less than two and a half tenths of one per cent ash or mineral matter, the same being the product of the material from which said vinegar is manufactured. All vinegar shall be made wholly from the fruit or grain from which it purports to be or is represented to be made, shall contain no foreign substance, and shall contain not less than four per cent, by weight, of absolute acetic acid.

17. No person shall manufacture for sale, offer for sale or

have in his possession with intent to sell, any vinegar found upon test to contain any preparation of lead, copper, sulphuric acid or other mineral acid, or other ingredients injurious to health. All packages containing vinegar shall be marked, stenciled or branded on the head of the cask, barrel or keg containing such vinegar, with the name and residence of the manufacturer or dealer, together with the brand required in section 16 of this act.

18. No person shall offer for sale, sell or deliver for food or drink purposes, ice, natural or manufactured, containing any decomposed, putrid, infected, tainted or rotten animal or vegetable substance or any ingredient which is poisonous or injurious to health. If intended for food or drinking purposes, shall not be composed of water of lower standard of purity than that required for domestic purposes by the State Board of Health.

19. Any person or persons manufacturing for sale or selling or offering to sell any candies or confectioneries adulterated by the admixture of terra alba, barytes, talc or other earthly or mineral substances, or any poisonous colors, flavors or extracts or other deleterious ingredients detrimental to health, shall, upon proper conviction thereof, be punished by a fine of not less than ten nor more than one hundred dollars or imprisonment in the county jail not less than ten nor more than thirty days, or both such fine and imprisonment, in the discretion of the court.

20. No packer or dealer in preserved or canned fruits and vegetables or other articles of food, shall sell or offer for sale such canned or preserved fruits and vegetables or other articles of food, unless such articles bear a mark, stamp, brand or label bearing the name and address of the firm, person or corporation that packs same, or dealer that sells same. All soaked or bleached goods or goods put up from products dried before canning, shall be plainly marked, branded, stamped or labelled as such, with the words "Soaked" or "bleached goods" in letters not less

than two-line pica in size, showing the name of the article and name and address of the packer or dealer who sells same.

21. No person shall manufacture for sale, have in his possession with intent to sell, offer or expose for sale, or sell as fruit, jelly, jam, or fruit butter, any jelly, jam or imitation fruit similar compound made or composed, in whole or in part, of glucose, dextrine, starch or other substance, and colored in imitation of fruit jelly, jam or fruit butter; nor shall any such jelly, jam or fruit butter or compound be manufactured or sold, or offered for sale, under any name or designation whatever, unless the same shall be composed entirely of ingredients not injurious to health; and every can, pail or package of such jelly, jam or butter sold in this state shall be distinctly and durably labelled "imitation fruit, jelly, jam, or butter," with the name and address of manufacturer or dealer who sells same.

22. Extracts made of more than one principle must be labeled with the name of each principle or else simply with the name of the inferior or adulterant.

In all cases when an extract is labeled with two or more names, the type used is to be similar in size and the name of any one of the articles used is not to be given greater prominence than another. The word compound cannot be used. Extracts which cannot be made with fruit, berry or bean, and must necessarily be made artificially, as raspberry, strawberry, etc., shall be labeled "artificial." Chocolates and cocoas must not contain substances other than cocoa mass, sugar and flavoring and will not be required to be labeled "compound" or "mixture." Prepared cocoanut, if so labeled, shall contain nothing but cocoanut, sugar and glycerine, and shall not be classed as compound or mixture.

23. Whoever shall falsebrand, mark, stencil or label any article or product required by this act to be branded, marked, stenciled or labeled or shall remove, alter, deface, mutilate, obliterate, imitate or counterfeit any brand, mark, stencil or label

so required, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than twenty-five nor more than two hundred dollars, and costs of prosecution, or by imprisonment in the county jail for not less than thirty days nor more than ninety days, or by both such fine and imprisonment in the discretion of the court, for each and every offense.

24. The taking of orders, or the making of agreements or contracts by any person, firm or corporation, or by any agent or representative thereof, for the future delivery of any of the articles, products, goods, wares or merchandise embraced within the provisions of this act, shall be deemed a sale within the meaning of this act.

25. Every person manufacturing, offering or exposing for sale or delivery to a purchaser any article intended for food, shall furnish to any person, or analyst or other officer or agent appointed hereunder who shall apply to him for the purpose and shall tender him the value of the same, a sample sufficient for the analysis of any such article which is in his possession. Whoever hinders, obstructs or in any way interferes with any inspector, analyst or other officer appointed hereunder, in the performance of his duty, and whoever wilfully neglects or refuses to do any of the provisions of this act, shall be guilty of a misdemeanor, and upon conviction shall, where no specific penalty is prescribed by this act, be punished by a fine not exceeding two hundred nor less than twenty-five dollars, or by imprisonment in the county jail for a period not exceeding ninety days, or by both such fine and imprisonment, in the discretion of the court.

26. All acts and parts of acts inconsistent with this act, and section 6 of an act entitled "An act to prevent the adulteration of butter and cheese, or the sale and disposal of the same, or the manufacture or sale of any article as a substitute for butter or cheese, or any article to be used as butter and cheese," approved June 1, 1881, be and they are hereby repealed.

27. For the purpose of enabling dealers in products affected by this act to dispose of same without loss, it is hereby expressly provided that the penalties of this act, and prosecution under the same, are suspended until the first day of July, 1900.



DIRECTORS' MEETING

February 24, 1904, at Decatur, Ill.

Directors of the Illinois Dairymen's Association met at Decatur, Ill., February 24, during the State Farmers' Institute convention to close up the business of the Greenville convention and to elect a secretary and treasurer. Directors present were: Joseph Newman, J. R. Biddulph, Irvin Nowlan and L. N. Wiggins.

The minutes of the previous meeting were read and approved. Reports of the secretary, Geo. Caven, and treasurer, H. H. Hopkins, were read and referred to Directors M. Long and G. H. Gurler to be audited and approved.

In regard to the dairy field work in the state being done under the dairy school of the University of Illinois, the following motion was offered and adopted:

Whereas, the dairy field work in the state would be better systemized if put under the direction of one man, therefore be it

Resolved, That we request that the whole field work in the state be put under the direction of A. J. Glover.

It was moved, seconded and adopted that the President, Secretary and M. Long secure bids and let the contract for printing the annual report, including the report of the Greenville convention.

The secretary was directed to correspond with U. S. Baer of the Wisconsin Cheesemakers Association in regard to dates for the next annual convention and arrange dates which will not

conflict with the dates for the cheesemakers' convention. "Since the directors' meeting the secretary has corresponded with Mr. Baer and announces the dates for the next convention of the Illinois Dairymen's Association to be Tuesday, Wednesday and Thursday, January 10, 11 and 12, 1905.

On motion the directors proceeded to the election of a secretary.

Moved and carried that the President be directed to cast the vote of the directors for Geo. Caven as secretary. The President announced that he had cast the ballot and that Mr. Caven was elected for the ensuing year.

Moved and carried that the directors proceed to elect a treasurer. On the informal ballot there were three nominees, H. H. Hopkins, the old treasurer had sent word that he would prefer to give up the office which he had held several years. On the first formal ballot John Coolidge, of Galesburg, had the majority vote and President Newman declared him elected treasurer for the ensuing year. On motion the directors adjourned.

Geo. Caven, Secretary.

Hinckley, Ill., February 22, 1904.

To the Board of Directors:

Gentlemen:—I have the honor to submit the following report on money received and paid out by the treasurer from July 1, 1904, to the present time.

RECEIPTS.

July 10, 1903, by check from the President	\$1500 00
Jan. 25, 1904, by check from the secretary.....	330 00
Feb. 3, 1904 by check from the secretary	152 10
Feb. 8, 1904 by check from the secretary	20 00
Total	<u>\$2002 10</u>

EXPENSES.

Check No. 733	7 00
Check No. 734	105 75
Check No. 735	26 10
Check No. 736	35 00
Check No. 738	623 10
Check No. 739	17 10
Check No. 740	100 00
Check No. 741	61 65
Check No. 742	49 70
Check No. 743	4 00
Check No. 746	20 15
Check No. 747	25 90
Check No. 748	25 65
Check No. 749	12 86
Check No. 750	26 95
Check No. 751	21 14
Check No. 754	36 20
Check No. 756	23 10
Check No. 757	18 00
Check No. 758	7 00
Check No. 759	16 35
Check No. 760	10 20
Check No. 761	3 00
Check No. 762	11 70
Check No. 763	18 00
Check No. 764	11 10
Check No. 765	5 10
Check No. 769	14 70
Check No. 770	20 70
Check No. 773	12 80
Check No. 774	14 00
Check No. 775	2 00
Check No. 776	12 00
Check No. 777	4 00

Check No. 778	6 00
Check No. 780	20 00
Check No. 781	23 70
Check No. 782	25 60
Check No. 783	20 00

Total\$1497 30

This shows a balance of \$604.80, but not all the checks issued have been presented for payment and the expenses of the convention are not all in. According to the estimate of the secretary of bills outstanding which include the bills of several speakers at the convention, the items of expense in preparing for the convention, the expenses of the stenographer for reporting the meeting and preparing the report for publication, the last half of the secretary's salary for the year and minor expenses, the sum on hand will meet all these requirements and possibly leave a small surplus. One less meeting of the directors was held this year, it not having been necessary to meet to locate the convention and on that account the matter of expense of the association for the year was reduced and we feel sure of closing the business of the year without a deficit.

Respectfully,

H. H. HOPKINS, Treasurer.

Chicago, February 24, 1904.

To Directors Illinois Dairymen's Association:

I have the honor to report on the receipts and expenses of the office of secretary for the convention of 1904 as follows:

RECEIPTS.

By check from treasurer	\$ 35 00
By check from treasurer	26 75
Memberships	113 00
Citizens of Greenville	150 00

Cry. Pkg. Mfg. Co.....	50 00
F. D. Moutlon & Co.....	10 00
Elgin Butter Tub Co.....	10 00
Diamond Crystal Salt Co.....	10 00
M. H. Fairchild & Bro.	5 00
J. B. Ford Co.	10 00
P. M. Sharples	10 00
DeLaval Separator Co.	35 00
Wells & Richardson Co.	20 00
Worcester Salt Co.	10 00
Blanks & Hank Supply Co.	10 00
Dairy Mutual Insurance Co	10 00
Colonial Salt Co.	20 00
Heller & Merz	20 00
Vermont Farm Machine Co.	30 00
D. H. Bussell & Co.	10 00
Empire Cream Separator Co.	20 00
Sale of butter	72 10
By check from treasurer	72 60
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Total	\$759 45

EXPENSES.

Freight and express	\$ 17 40
Stamps	57 00
Postal cards	25
Exchange	1 10
Paper and envelopes	8 15
Telephone and telegrams	3 00
Printing, folding and addressing	13 00
Labor	3 50
Miscellaneous	1 25
J. R. Biddulph	10 00
Cartage	75
Traveling expenses	28 95
Jan. 25, paid H. H. Hopkins, treasurer	330 00

Feb. 3, paid H. H. Hopkins, treasurer	152 10
Feb. 8, paid H. H. Hopkins, treasurer	20 00
March 8, paid H. H. Hopkins, treasurer	113 00
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Total	\$759 45

In the items of expense, the large ones are stamp, freight and express and the folding, addressing, printing, etc. These are easily understood when it is known that we mailed out over 300 of the bound reports, 1,000 programs, 750 posters, two sets of circular letters to members in regard to the convention and entry blanks. One of the best means of advertising the convention was by means of articles already prepared for printing. The articles were written and set up in the office of Chicago Dairy Produce, and after being corrected in type were run through the proof press and 75 copies taken. These were mailed to the editors of papers along the Vandalia line and other towns near Greenville with the request to each editor that he use part or all of the article. The express and freight item is larger this year because a larger proportion of the reports were sent out from the secretary's office instead of from the publishers. In this report the item of \$113 from memberships appears, and not in the treasurer's report, the reason being that the money has not yet been paid over to him.

Respectfully,

GEO. CAVEN, Secretary.

GREENVILLE BUTTER SCORES

Creamery Butter.

A. E. Thompson, Poplar Grove	97
L. Nielson, Camp Point	92
Lewis E. Johnson, Byron	91
P. J. Springsteen, Egan	92½
S. W. Peck, Winchester	85½
Chas. M. Dyer, Hinckley	96
Fred C. Swayzez, Mascoutah	93
S. J. Van Kuren, Franklin	89½
A. A. Shoemaker, Nokomis	91
Peter Nelson, Creston	87
I. E. Schoch, Freeport	93
Lars Johnson, Stewardson	92½
G. A. Cutler, Belvidere	91
John Mingle, Toledo	88
S. T. Welsh, Lake Creek	89
Samuel McConaghie, Somonauk	93½
H. R. Duell, Sandwich	95½
Wm. Carbaugh, Nursery	88
I. G. Machamer, Lanark	86½
George Bloyer, Harper	94
M. Long, Greenwood	92

Dairy Butter.

Thomas Slouborg, Savanna	94
S. W. Peck, Winchester	89
John C. Foster, Sparta	87
Mrs. E. H. Springer, Springfield	85
Mrs. H. P. Purviance, Lincoln	95½
E. I. Crosior, Utica	87
Mrs. T. J. Hull, Beaver Creek	85

Cheese.

John Scharth, Mascoutah	86
J. R. Biddulph, Providence	90
J. R. Biddulph, Providence	81

A. E. Thompson, who scored highest, being an employe of a member of the Elgin Board of Trade, won the gold medal given by that body to an employe of any member who scored highest at this convention.

MEMBERSHIP LIST FOR 1904.

A

Atchison, M. C., Woodbine.	Adams, Chas, J., Loda.
Alexander, C. B., Chicago (Star Union Line).	Anderson, C A., Altuna.
Allen, Fred J., (C. M. & St. P. R. R.)	Ardrey, R. G., Oakdale.
	Austin, F. G., Effingham.

B

Biddulph, J. R., Providence.	Boehmer, H., Barrington.
Barwell, J. W., Waukegan.	Breed, G., Galesburg.
Boethke, Wm., Elmhurst.	Bloomfield, R. A., Mt. Sterling.
Bloyer, Otto, Elkhorn Grove.	Burton, G. F., Mt. Carroll.
Bloyer, George, Harper.	Baldwin, Geo. H., Mendon.
Blood, F. J., Chicago (Wells, Richardson & Co).	Beatty, Frank, Fairhaven.
Browning, H. A., Elgin.	Benton, D. C., Kaneville.
Buelter, Henry, Batavia.	Bartholomew, C. L., Cedarville.
Barclay, A. C., Elgin.	Brinker, F. H., Winneshiek.
Bueler, Anton, Bemes.	Baldwin, R. C., Redpath.
Bell, K. J., 306 Fisher bldg., Chicago.	Brandt, W. B., Barrington.
Betts, H. S., Rockford.	Burghart, A., 6038 Vernon Ave., Chicago.
Bagley, F. R., Chicago (Francis D. Moulton & Co.)	Blacet, Stephen, Greenville.
	Blizzard J. J., Greenville, R. R. 2.

C

Clapp, C. E., Quincy.	Campbell, A. B., Oregon.
Carpenter, K. B., Thomson.	Coolidge, John, Galesburg.
Carbaugh, Wm. T., Lanark, R. R. 1.	Cooley, Fred A., Yorktown.
Christ, John, Washington.	Crosier, Eli I., Utica.
Charles, A. D., St. Charles.	Caven, George, Chicago.
Carr, George S., Aurora.	Cook, F. L., Lyle.
Coolidge, J. H., Galesburg.	Cooper, Miss Mae, Steward.
Camp, L. E., Mt. Horeb, Wis.	Carr, J. W., Aurora.
Crissey, N. O., Avon.	Carr, F. A., Aurora.

Cooley, J. H., Cleburne, Texas
Collyer, W. D., Chicago.
Cutler, Geo. A., Herbert
Campbell, M. S., Genoa.
Collidge, C. P., Winnebago.

Cassens, Geo., Alhambra.
Cobb, E. N., Monmouth.
Carlisle, H. N., Effingham.
Colwell, J. H., Chicago (The Sharp-
les Co.)

D

Davis, S. E., Elgin.
Davis Bros., Fairchild.
Danielson, Peter, McConnell.
Davis, C. W., Woodstock.
Davenport, Prof. E., Urbana.
Davis, A. E., Jr., Urbana.
Davis, Wm. F., Quincy.
Duell, H. R., Sandwich.

Dunlap, Mrs. Theodore, Abingdon.
Dorsey, L. S., Moro.
DeLano, H. W., Sugar Grove.
Dyer, Chas. M., Hinckley.
Dorsey, Clarence, B., Moro.
Daniels, J. W., Greenville.
Defrees, Tallie, Greenville.
DeLaval Separator Co., Chicago.

E

Eastman, H., Shabona.
Everts, M. C., 60 Wabash ave., Chi-
cago. (The J. B. Ford Co).

Erf, Prof. Oscar, Manhattan, Kan.
Eade, A. T., Greenville.

F

Finch, N. W., Victor
Frein, H. P., Smithton.
Freund, S. H., Johnsburgh.
Francisco, M., Wauconda.
Fulrath, P. G., Bristol.
Fraser, Prof. W. J., Urbana.
Fairchild, A. E., Chicago (M. H.
child & Bro.)

Fredericks, Andrew, Elgin (De
Laval Separator Co).
Fourbain, B. C., Belvidere.
Fryer, Wm. Winslow.
Foster, J. C., Sparta.
Fischer-Mann, Commission Co., 907
N. 3rd St., St. Louis, Mo.

G

Gurler, G. H., DeKalb.
Gullickson, Martin, Frankfort Sta-
tion.
Gray, Samuel, Hastings.
Grout, A. P., Winchester.
Gibbons, T. H., Elgin.
Glover, A. J., Elgin.

Gray, Miss Nellie, Hastings.
Greene, S. F., 7617 Union ave., Chi-
cago (Miller Pasteurizing Ma-
chine Co).
Guseking, W. G., Altemont.
Grube, Geo., Greenville.

H

- Herman, G., Manhattan.
 Houghland, A. C., Owatonna, Minn.
 Heller & Merz.)
 Hopkins, H. H., Hinckley.
 Hollister, W. S., Pana.
 Hopkins, Geo. C., Oregon.
 Haecker, Prof. T. L., St. Anthony
 Park, Minn.
 Hicks, J. E., Thompson.
 Henry, R. J., Millersburg.
 Hoppensteadt, Geo. W., Eagle Lake.
 Hostetter, W. R., Mt. Carroll.
 Hardiker, F. H., Chicago (Mer-
 chants' Despatch Transportation
 Co).
 Hostetter, A. B., Springfield.
- Harvey, W. R., Clare.
 Herkenheim, P. J., Malta.
 Howe, T. J., Owatonna, Minn.
 Horsing, S. S., Stillman Valley.
 Howell, Carrie B., R. R. No. 2, Ur-
 bana.
 Hatch, Fred L., Spring Grove.
 Hall, C., R. R. No. 1, Cantrill.
 Hunt, James R., Ottawa.
 Hovey, E. L., Capron
 Hilfiker, Jas. H., Manhattan.
 Hart, Prof. J. W., Urbana.
 Hopper, H. A., Urbana.
 Hayden, C. C., Champaign
 Haecker, Prof. A. L., Lincoln, Neb.

J

- Jennings, A. A., Chicago (Star
 Union Lines).
 Johnson, Lovejoy, Stillman Valley.
 Johnson, L. E., Byron.
- Janes, W. E., Hinsdale.
 Jensen, S. M., Orangeville.
 Johnson, Lars, Stewardson.

K

- Kerns, Walter, Warren.
 Knigge, L. H., McHenry.
 Kendall, George, Mt. Carroll.
 Kirkpatrick, J. R., Oakdale.
 Kilbourne, C. S., Aurora.
- Kruse, Wm., Ontarioville.
 Kimzey, W. R., Tamaroa.
 Keeney, Z. J., Chicago (Sharples
 Co).
 Kent, A. H., Mulberry Grove.

L

- Ludwig, Mat, Lockport.
 Lally, W. A., Chicago (Erie Des-
 patch Transportation Co).
 Long, M., Woodstock.
 Lucas, O. F., Belvidere.
 Lorah, G. W., Sugar Grove.
 Litchhardt, Herman, Schaumburg.
- Lorengen, C., Rockford.
 Latzer, J. A., Delta, O.
 Leass, S. L., Sullivan.
 Lindley, Hon. C. J., Greenville.
 Lohmen, Wm. C., Sorento R. R. 2.
 Lee, Carl E., Elgin.

M

Mann, W. E., Pecatonica.
Metzger, F. L., Millstadt.
McNish, F. J., Chicago (Creamery
Package Mrg. Co).
Moore, W. S., Chicago.
Muller, F. J., Milledgeville.
McCredie, Wm., Elgin.
Mallory, Grant, Freeport.
Mason, J. L., Elgin.
Mason, J. P., Elgin.
McFarland, Frank, Big Rock.
Myers, O., Little Rock.
Murphy, R. R., Garden Prairie.
Monrad, J. H., New York.
Musselman, S. L., Brookville.

Maurer, W. H., Rock Grove.
McFarland, Frank, Big Rock.
McConnell, Carrie, Ridott.
Michener, E. P., Chicago (Brigg's
House).
Mann, F. J., Gillman.
Machamer, I. G., Lanark.
McNurlin, Wm. L., Stewart.
Mingle, John, Toledo.
Montgomery, A. R., Capron.
Misner, F. H., Rockford.
Meyer, Adolph, Greenville.
McConaghie, Samuel, Victor.
Morris, Geo. O., Greenville.

N

Nowlan, Irvin, Toulon.
Nelson, Peter, Creston.
Newman, Joseph, Elgin.
Nelson, L., Camp Point.

Newman, John, Elgin.
Nolting, E. L., Elgin.
Nolting, August, Elgin.
Newman, Balch W., Elgin.

O

Olson, Chas., Kirkland.
Ohi, Wm., Stevens.
Osgood, H. B., Chicago (Cry. Pkg.
Mfg. Co.)

Owen, E. R., 204 Market St., St.
Louis (Blanke & Hank.)

P

Poplett, C. A., Dunlap.
Powell, J. W., Peoria (Merchants'
Despatch Transportation Co).
Petit, Peter, North Aurora.
Patterson, J. P., Plainfield.
Peak, S. W., Winchester.
Powell, L. A., Bowen.
Phillips, Louis, Germantown.
Patton, R. A., Hanna City.
Peterson, Berger, Round Grove.
Palmer, F. R., Pearl City.

Phillips, J. A., Damascus.
Patterson, R. M., Chicago.
Purvis, Miller, 224 Dearborn St.,
Chicago.
Pfingston, H. W. F., Schaumburg.
Pierce, Harry, Savanna.
Palmer, H. W., McLean.
Purviance, Mrs. H. P., Lincoln.
Patterson, R. M., Chicago (State
Food Commission)

R

Redpath, R. G., Baldwin.
Rutter, Geo. E., St. Libory.
Reed, Geo. Belvidere.
Rawson, Frank E., Alden.
Rice, H. B., Lewiston.

Roessler, Theodore, Shelbyville.
Robertson, N. Y., 262 Wabash ave.,
Chicago (Diamond Crystal Salt
Co).
Riegel, John O., Highland.

S

*Shearer, A. J., Aurora.
Sykes, Josiah, Kaneville.
Sudendorf, E., Clinton (Wells, Richardson & Co).
Spanger, E. E., Big Rock.
Sloggett, John, Hinckley.
Stewart, John, Elburn.
Sullivan, Miss Lizzie, Providence.
Sally, A. J., Garden Prairie.
Spies, L. A., St. Jacob.
Staples, W. S., Hooppole.
Steidley, A. B., Carlinville.
Spencer, C. V., Chicago (Santa Fe Railroad).
Swanzy, L. M., Ridott.
Sawyer, J. F., 79 Dearborn St., Chicago.
Schlattman, Fred, St. Libory.
Springer, Mrs. Eva H., Springfield.
Slouborg, Thomas, Savanna.
Straw, T. H., Shannon.
Springsteen, P. J., Egan.
Schoch, Irwin E., Freeport.

Seidel, C. H., Orangeville.
Speed, Chas. V., Baileyville.
Savage, B. W., Sigel.
Stevens, J. D., 306 Fisher Bldg.,
Chicago (Empire Separator Co).
Scotey, W. H., Greenup.
Spaulding, F. W., 22 Sacramento
St., Chicago.
Strain, Jas. A., Greenville.
Shoemaker, A. A., Nokomis.
Swayze, Fred C., Mascoutah.
Scharth, John, Mascoutah.
Snyder, J. E., (Cry. Pkg. Co.) Chicago.
Stowell, J. E., Chicago (The Sharples Co).
Swartz, S. A., Greenville, R. R. 1.
Sieck, W. J., Greenville.
Schumaker, John, Eldermont.
Shilling, S. B., Mason City, Ia.
Seaman, J., Greenville.
Stocker, J. J., Greenville.
*Deceased.

T

Thompson, A. E., Poplar Grove.
Thompson, Frank B., Greenwood.
Thurston, Henry F., 355 Dearborn
St., Chicago.

Taylor, W. H., Stillman Valley.
Thornton, Chas. H., Argyle.
Tindall, W. K., Malta.

V

Van Patten, David, Plainfield.

Van Kuren, S. J., Franklin.

W

- Whitney, R. A., Greenville.
Waterman, M. H., 303 W. North St.,
Danville.
Williams, C. H., Chicago (Colonial
Salt Co).
Wright, F. W., Joslin.
Wood, R. L., Woodhull.
Wilson, Geo. R., Monmouth.
Welford, R. G., Red Bud.
Wilson, E. L., Manhattan.
Wilder, C. R., Manhattan.
Waspi, J. S., Spring Grove.
Wiggins, L. N., Springfield.
Woodard, C. H., Big Rock.
Winton, W. W., Madison, Wis. (C.
M. & St. P. R. R.)
Waterman, Geo. E., Garden Prairie.
Wentworth, E. M., Davenport, Ia.
(Star Union Lines).
Willson, D. W., Elgin.
Weaver, Vernon A., Greenville.
Welsh, S. T., Lake Creek.
Wise, Geo., Greenville.
Wright, S. N., Elgin.
Woolverton, D. C., 154 Lake street,
Chicago.
Walline, C. W., Cambridge.
Wader, August, Highland.
Wolf, Mrs. E., Rock City.
Wood, D. E., Elgin.
Willson, W. C., Elgin.
Winnebago Butter Mfg. Co., Win-
nebago.
Wilkening, W. C., Schaumberg.
Walton, Edw. B., Arma.
Wescott, N. E., Dennison, Ia.
Welch, W. K., Wyandotte Mich.
Woodburg, A. E., Danville.

Y

- Young, H. J., Stillman Valley.
Young, W. H., Aurora.
Young, F. L., Kaneville.

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